WOODWORKER

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MAKING THE TWIST LEG WITHOUT A LATHE

FEATURES THIS MONTH

ARTIST'S SKETCH BOXES : ELECTRIC TABLE LAMPS
TRUCKS AND TROLLEYS FOR HOME OR WORKSHOP
GARDEN LIGHTS : HOW TO USE THE STEEL SQUARE
FURNITURE FEATURES : READERS' QUERIES

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SHOE CLEANING STOOL

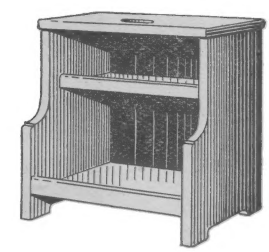

FIG. 1. INVALUABLE IN KITCHEN OR SCULLERY. — Common deal if reasonably free from knots will do.

A USEFUL article of this type—a kitchen stool equipped for holding materials for boot polishing—can of course be made in the simplest way, the various parts butting and the whole glued and nailed or screwed together. A stool of this kind calls for no comment, all that is necessary being to cut the wood to size and put the thing together.

On the other hand, a piece that will outlive the century can be made at the same cost and with little extra labour. If considered for an elementary model in the handicraft centre the joints used will be decided by the instructor. Modifications, as desired, may be made in respect of sizes and details.

For the ends (A), bottom (B) and top (F) sound deal finishing $\frac{5}{8}$ in. will serve. The shelf (D) and back (G) can be of $\frac{1}{4}$ in. or $\frac{5}{16}$ in. plywood, and $\frac{3}{8}$ in. or $\frac{1}{2}$ in. may be taken for the shelf edgings (C and E). The dimensions of parts will be :

		Long ft.	Long in.	Wide in.	Thick in.
(A)	2 Ends	1	$2\frac{1}{2}$	$9\frac{1}{2}$	$\frac{5}{8}$
(B)	Bottom	1	$1\frac{1}{2}$	9	$\frac{5}{8}$
(C)	Edging	1	$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{1}{2}$
(D)	Shelf	1	$1\frac{1}{2}$	$5\frac{1}{2}$	$\frac{5}{8}$
(E)	Edging	1	$1\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{8}$
(F)	Top	1	$2\frac{1}{2}$	$7\frac{1}{2}$	$\frac{5}{8}$
(G)	Back	1	1	$13\frac{1}{2}$	$\frac{1}{4}$ ply

The lengths allow for housings, but the thicknesses are net.

Construction. — Cut the parts to size, and mark and cut the shapings on ends (A). For lasting wear the top (F) will be cut to finish flush and be dovetailed to the ends. (Through dovetailing will do.) Alternatively it may be dovetail-housed. The joint must, of course, be secure, as the stool will always be lifted by the top.

Again, for the soundest work, the bottom (B) should be dovetail-housed to the ends. The narrower shelf (D) need only be plain-housed ; or, as it might be wanted to have this shelf movable, it could rest on fillets. On account of the edgings (C and E) the shelves do not need to be cut back at front. The housings, however, will be stopped as shown. The edgings (C and E) are glued to the shelves and might have tongues to enter the ends.

The plywood back (G), for a quickly-made stool, might be screwed on over all. A rebated back, however, is well worth the little extra trouble. As indicated, it stops at the bottom shelf (B). (169)

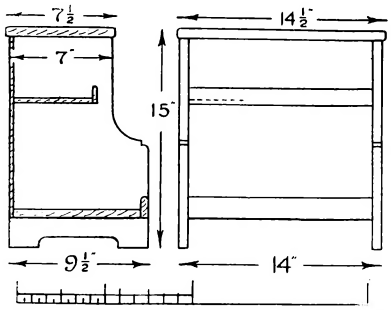

FIG. 2. END SECTION AND ELEVATION.

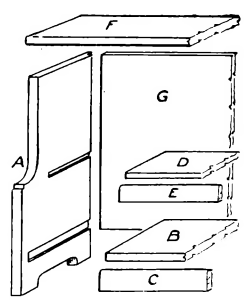

FIG. 3. CONSTRUCTION

WOODWORKER

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SKETCHING BOXES

There is beauty all around us, in factory chimneys and puddles as well as in thatched cottages, but much of it is missed owing to lack of observation. It is a pity, for life is never boring to the keen spectator, and the man who can draw and paint the trees in their various seasonal moods will treat wood reverently, realizing it as the product of life.

Outdoor sketching is a delightful, inexpensive, and educational hobby and can substitute camera study which is now denied to us owing to lack of available material. There is no police objection to outdoor sketching providing the Control of Photography Orders are not contravened. No sketching is allowed in restricted areas, so make sure about your own district. Also for town or city work it is advisable to ask the Chief Constable for a permit.

FOR the serious student these two boxes are complementary. The larger, which can be used for oil or water colour sketching, takes a paper or board size 16 ins. by 14 ins. The smaller box is intended for quick studies and, incidentally, would make a good experimental outfit for a boy or girl. If you have a colour box already you can arrange the interior to suit it. A paint box that will go in either will save expense. In an article of this description lightness is essential, so use mahogany or whitewood and very thin plywood for top and bottom of case and the palette.

Construction of each is simple. In the large case the corners of the sides are dovetailed, the back and front corners varying slightly as will be seen in the sketches (Figs. 5 and 6.) When the box sides are being glued up together make sure the box is square and out of winding. When set trim with the smoothing plane and glue and pin on the thin plywood top and bottom. The top need not be pinned along the front as it will eventually be cut away for the hinged flap (Fig. 6).

Do not use panel pins too long or the teeth of your saw will be fouling the points when you saw the box in two. Before sawing open, plane and sandpaper all sides to a nice finish as this cannot be done successfully afterwards.

After the box has been sawn open remove the front portion of the lid as shown in Fig. 7, and glue and pin on a strip along the top having previously bevelled it off at the back, and add the flap. This flap has a bead let into its closing edge to engage a corresponding hollow worked along the top edge of the lower part. This makes the box weather tight. Hinge the flap and the lid with a pair of 1½ in. brass butt hinges to each.

Interior fittings.—The box is now ready for fitting. Before putting in the partitions (P) Fig. 2 decide upon your colour box and palette. A box you can make is shown in Figs. 4 and 8, and will hold all the pans of colour you are likely to need. Keep it light, say a bit of beech for the sides comb-jointed together and a plywood bottom. The sides and back

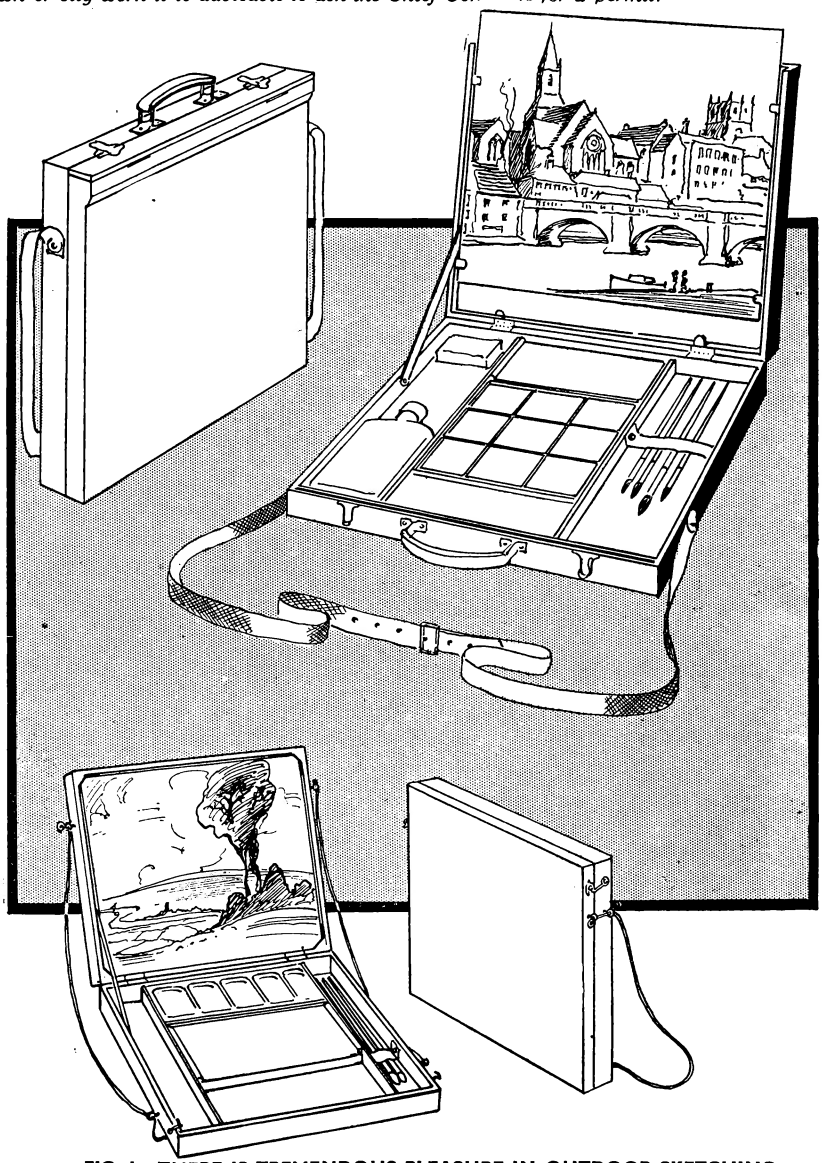


FIG. 1. THERE IS TREMENDOUS PLEASURE IN OUTDOOR SKETCHING
Two boxes are shown here. That at the top is for the artist and measures 17 in. by 15 in. The smaller box below is suitable for the youngster and is 12 in. by 11 in.

are grooved for a sliding lid before final assembly. This lid prevents the colours drying up and any softened wet colour getting on to your sketch after closing the box.

The divisions (D) Fig. 8 are glued and pinned in, allowing a little space each end of the pans for metal holders to be pushed in. Alternatively a spot of glue on the bottom of the pans will keep them in the box. The palette is the same width as the box with a bead glued and pinned all round and mitred at the corners. Beads $\frac{1}{4}$ in. by $\frac{1}{8}$ in. are enough, the partitions being finer still, $\frac{1}{16}$ in. box corners that are inlaid into top edges would serve admirably for these.

Whatever the width of box and palette allow $\frac{1}{8}$ in. more between the partitions (P) so that a little $\frac{1}{16}$ in. thick felt can be glued along each side to prevent box and palette rattling. The palette is kept up level with the top of the box resting upon two fillets glued and pinned to the partitions (P). Some sort of stay (S) Fig. 2 is required to hold the lid at a proper angle for working. Part of an old folding steel rule would do for this; also six metal holders (H) Fig. 2. These keep the sketches in place in the lid. Brass N.P. bolt keepers would do well for these, screwed to the lid. Brushes are held by a special clip or just a short stretch of wide elastic as shown (Fig. 2).

Lastly fit an attache case handle and a pair of attache clips. An extra convenience is found in a web strap with buckle. This is bolted to the case with wide washers under the heads. It is fastened around the back when sketching seated, holding the box firmly on the knees.

Smaller Box.—This is made in a similar way to the larger one excepting that combed or mitred and pinned case corners will suffice. There is no flap, the drawings being kept in by thin veneer corners or by the use of brass leaf bottoms let in flush with the edge of the lid. The box should be cut open with the bottom deep enough to hold the colour box shown in the larger case.

The case is kept closed by brass side hooks and eyes and carried by neat sash cord threaded through brass eyes screwed into each half of case (Fig. 1). Enamel the colour box and palette a pure white, smooth and hard. Stiff the inside of the box and paint the outside an earth, dark grey green or other suitable colour and varnish. Metal fittings should be removed when painting.

Painting Hints.—A few hints to those beginning. Buy the best; it pays. Pans of colour are more convenient and economical in use than tubes of colour. Whatman, Arnold, or similar rough surface paper pasted to cardboard prevents cockling and your drawing is already mounted. Damp and paste the paper, *not* the cardboard. (300)

(*See Figs.* 5-10 *on opposite page.*)

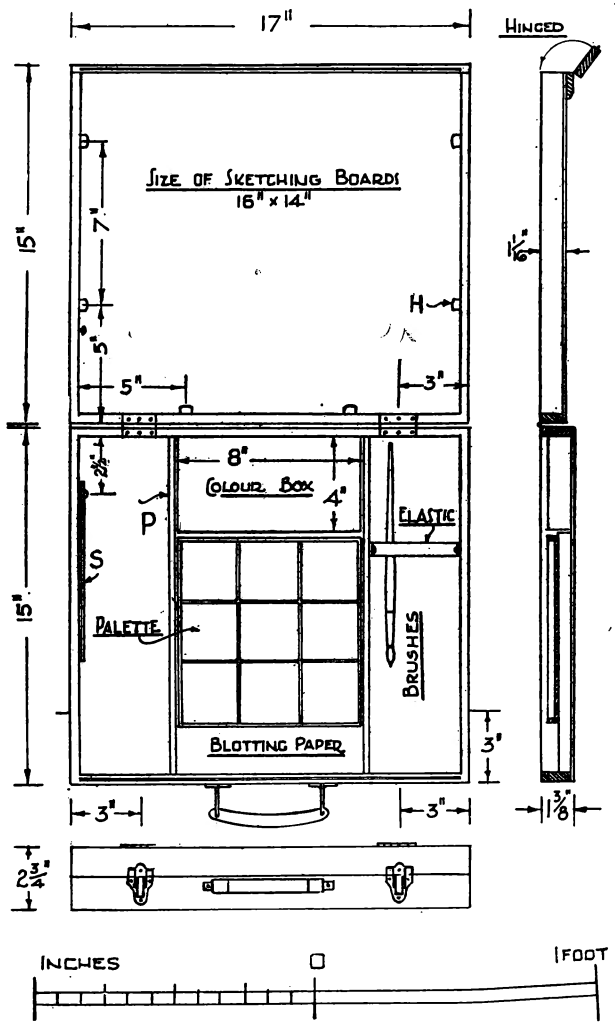


FIG. 2. PLAN AND SECTION OF ADULT BOX.

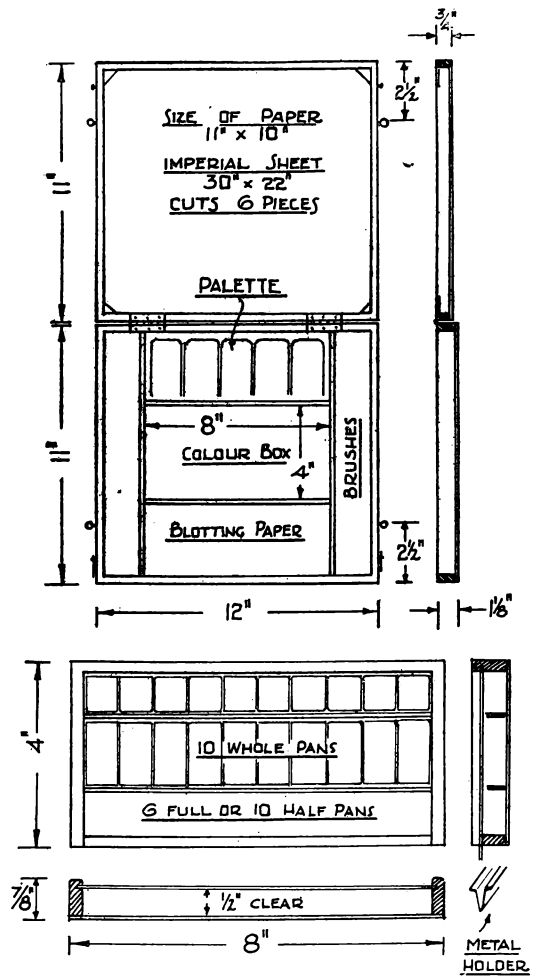


FIG. 3. PLAN AND SECTION OF YOUNGSTER'S BOX
FIG. 4. ENLARGED PLAN OF COLOUR BOX.

THE HOME GUARD WINS

I WAS brought up to admire the ant. "Go to the ant, thou sluggard," is one of those quotations that are apt to stick in the mind of impressionable childhood, creating a tradition of ceaseless activity and hard work till the very sight of an ant is liable to cause a stir of conscience. But in this, as in many other things childhood is nourished on half-truths and nowadays the sight of an ant rouses me to very different feelings —by no means complimentary to the ant.

* * *

For of all the pushful tyrants, of all the Hitlers, Nazis and Fascists rolled into one, this creature is the worst. Yes, you have guessed it. I have—like many another at the present time—been suffering from an invasion of ants. Not only are the creatures not content with overrunning my garden and my neighbours' gardens, not only are they not content with the whole world of Nature which is theirs, but they must invade my house as well. Nature's banquet is not enough. They want mine too. And that is where I left off being complimentary to ants and settled down grimly to fight them. It's the only way of dealing with the Hitlers of this world, who can't be content with the fair garden that has been given them but must reach out greedily to other people's. And bring upon themselves destruction.

* * *

But to repulse them took some doing. The objective of the first invading army was a tin of treacle in the larder, and they reached it before the "Home Guard" discovered their presence. As it was by that time late at night I had to fight them with the only weapon at hand—baking powder, which I had heard was good, and some garden insecticide which I guessed—and rightly—would not be sufficiently strong to be very effective. Neither for that matter was the baking powder, though it certainly held them in check when they found it in their runway. They hesitated, they circled round it and for a time the invasion slowed down. After that they came on in single spies, and I killed them one by one till nearly three o'clock in the morning. Oh, yes, ants are very persistent. You can count that a virtue in them, if you like. I didn't—at three o'clock in the morning. Then they decided to rush the position suddenly and an army of them came swarming at me over the kitchen tiles. Hastily I seized the garden spray and let them have the insecticide full blast in their faces. It blew them off their feet, and as soon as they could pick themselves up they scuttled off for dear life. Something had hit them—a new secret weapon, a typhoon, a tornado—they didn't know what. But they didn't like it. And that finished the battle for that night.

* * *

But of course they came again. The next day, having equipped myself with some proper ant destroyer, I well peppered their runway. It seemed then nothing but a wise precaution. There was no sign of life, no trail of ants, and the "Home Guard" was already rejoicing in its victory. Till someone opened the cake tin and a yell revealed that a second invasion had begun. They were there quite snugly—hundreds of them—swarming over a wartime cake in a frenzy of greedy appreciation, the side of the tin black with ants waiting their turn at the feast. In any case, it was their last. Battle joined again, and some time after they and the cake had been hurled to destruction, the last of the invaders was killed. We are still very much on the alert. I have sought and destroyed every ant's nest near the house, the place reeks of disinfectant and ant destroyer, but there is no sign of life. Victory is with the "Home Guard."

* * *

And what, you will ask, has all this to do with woodwork? Only perhaps this. The ant will fight for a tin of treacle and find destruction. Men will fight for power and riches, to be cheated, like the ant, when these are within their grasp. Happiness does not come from these things. It comes from developing our skill, our creativeness, from taking only what we need of the material things of life and knowing how to refrain. For these are only the means to an end. Not the end. And that is where we can reverse the lesson, and turn the tables on the ant. (309)

Heat your joints before using Scotch glue. It prevents chilling and makes for greater strength.

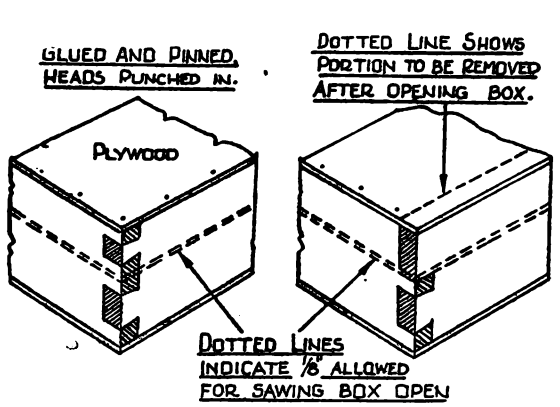


FIG. 5. BACK CORNER.

FIG. 6. FRONT CORNER.

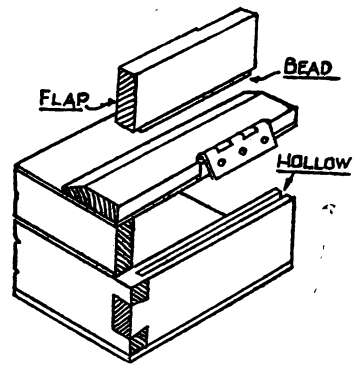


FIG. 7. FITTING THE FLAP.

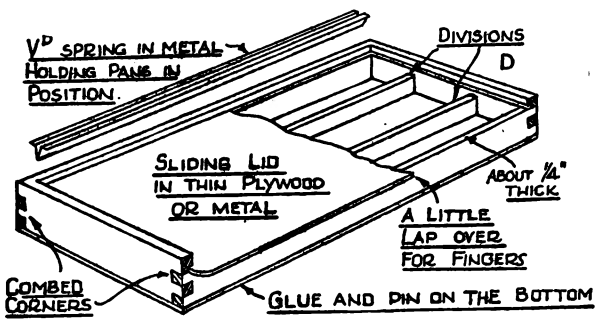


FIG. 8. HOW THE PAINT BOX IS MADE.

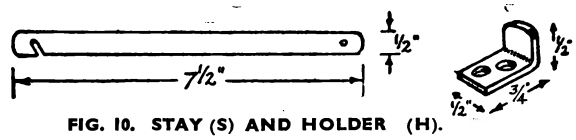


FIG. 10. STAY (S) AND HOLDER (H).

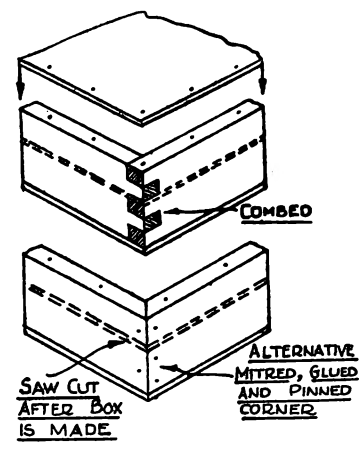


FIG. 9. CONSTRUCTION OF JUVENILE BOX.

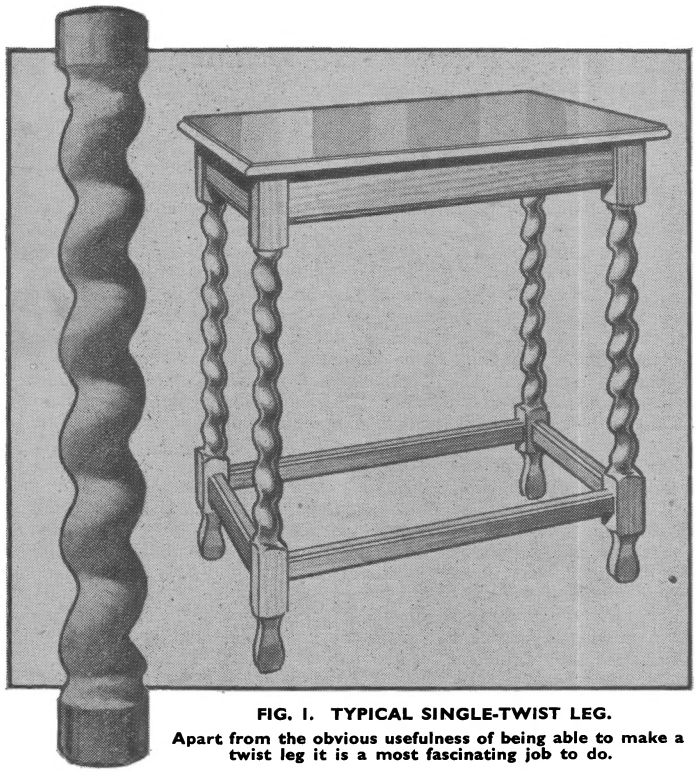


FIG. 1. TYPICAL SINGLE-TWIST LEG.

Apart from the obvious usefulness of being able to make a twist leg it is a most fascinating job to do.

MAKING THE TWIST LEG WITHOUT A LATHE

In normal times few would bother about making twist legs ; they can be obtained ready made so easily. Today, however, it is a different matter, and we all have to do jobs which would have been unnecessary five years ago. Possibly it may come as a surprise to some that twist legs can be made perfectly well without a lathe. If you have the latter it certainly rather simplifies matters, but it is not essential and you can in fact make a better leg than the ordinary cheap commercial variety.

IT may interest readers to know that the best twist-turned legs are still a combination of turning and carving, and that when they were first made in the 17th century the lathe played a quite secondary part in the manufacture. In this article we are going to assume that you have no lathe at all and are going to rely upon normal hand wood-working tools plus one or two carver's gouges. Even the last-named are not essential, but are certainly a great convenience.

Rounding the Wood.—Prepare your wood in the form of a square as in Fig. 3, and mark in the centres at both ends with the gauge. Continue the lines along the length of the wood as shown, using a pencil. Mark in circles at the ends, using dividers, and plane off the corners so that the square is reduced to an octagon as in Fig. 4. Finally take off the remaining corners, so rounding it, leaving the pencil lines untouched.

Pitch.—We have now the pitch and depth of the twist to consider. When a nut is revolved upon a bolt it rises by a certain amount at each complete revolution. That is its pitch, and a similar idea applies in a twist leg. Glance at A, Fig. 2. The rounded part of the twist at the top of the arrow passes spiralwise round the leg and when it reaches a point vertically beneath it has completed one revolution, and the distance down it has travelled is the pitch. There is no definite ruling about it, but generally the pitch is made to equal the diameter of the wood as in the present example. You can vary it, however, by way of experiment if you prefer.

Now for depth. The hollowed-out groove of the spiral can be cut in so deeply that it passes more than half-way through the wood, as at B, Fig. 2. This would be graceful enough, but would have little strength and would so be impracticable for most jobs. On the other hand, it could be shallow as at C, in which case it would appear as little more than an indeterminate ripple along the surface. Obviously something between the two is needed, and you can take into account the work the leg is expected to do. For instance, a heavy chair or table leg would have to be shallower than a spindle which carries no weight. This depth, by the way, does not affect the pitch.

Marking the Spiral.—We will assume that the pitch is to equal the diameter, and the next step must be to make a series of rings around the leg, their distance apart equalling the pitch. Thus, assuming the diameter to be $1\frac{1}{2}$ ins., the distance between AB, BC, etc., (Fig. 5) will be $1\frac{1}{2}$ ins. The rings are easily drawn by wrapping a piece of thin card with a straight edge around the wood as shown.

To mark the spiral, take a length of thin card having one edge perfectly straight and, holding the true edge at the point A, wrap it spiral-wise around the leg, adjusting the position so that it cuts the point B, then C, and so on as in Fig. 6. A drawing-pin can be used to hold the end temporarily. Run a pencil around the straight edge so marking in the centre of the rounded or high part of the twist.

Now turn to Fig. 5. You will see that AB, BC, etc. are divided into quarters, 1, 2, 3. Actually only the points 1, 3 are needed, but 2 is marked in because it is convenient to divide up into halves first. Using the length of thin card again, wrap it again round the leg to pass through the points 1-1, etc., thus being parallel with the first line. Repeat the process, this time making the line cut the points 3-3, etc. You thus have three distinct spirals passing down the leg as in Fig. 7, and it is the wood between 1-3 that is to be hollowed out. It is shown shaded in Fig. 7, and it is in fact a good plan to scribble between these lines on the actual leg so that there is no question as to what is to be cut away.

Incidentally, we may note that it is always as well to have a hollow at both ends of the spiral as the latter can then die out naturally. Hence the rings XY at the ends in Fig. 5.

Cutting the Groove.—A carver's V tool is convenient for the preliminary cutting out (see A, Fig. 8), but a carver's gouge can be used throughout if preferred. Gradually deepen the cut until the sides line up with the pencil lines.

Of course, the direction of the cut will have to change during every stroke and it should be in alignment with the spiral the whole time. The best way of holding the work is in the bench vice, cutting away each exposed part of the groove, giving slight turn, then cutting the newly exposed part, and so on until the whole is completed.

The gouge follows as at B, Fig. 8, care being taken to make the depth as equal as possible throughout. The sides should slope outwards slightly as at B. At all events avoid undercutting as at C. Once again let the gouge follow the line of the spiral.

Finishing the Rounds.—Using either chisel or flat gouge, take off the corners now as in Fig. 9. You will find that one side will cut easily ; the wood will have to be reversed for the other to be done. Working in this way you will find that the work will aproximate roughly to the finished shape.

To take out chisel and gouge marks a

(*Continued on page* 115)

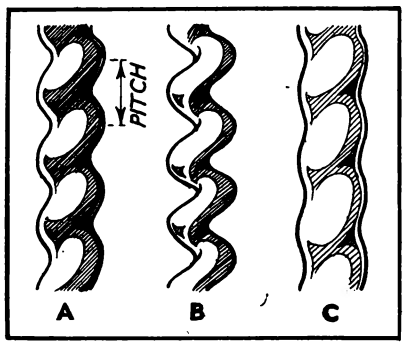


FIG. 2

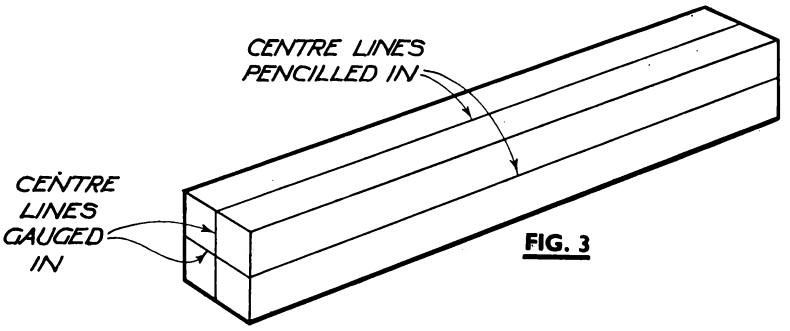


FIG. 3

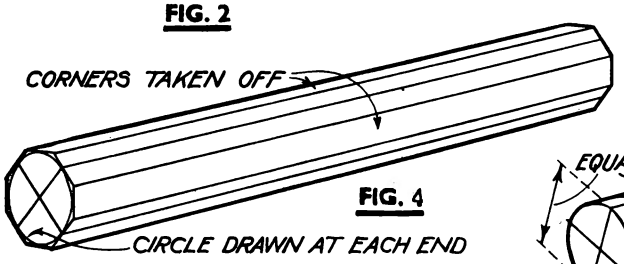


FIG. 4

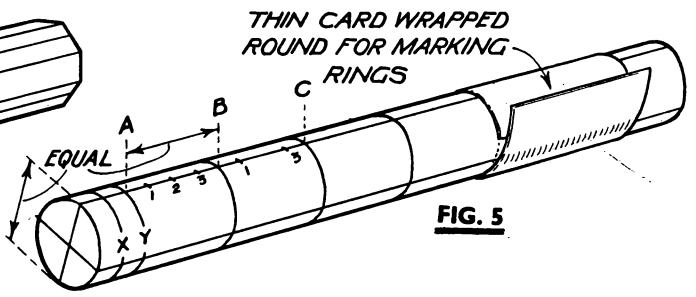


FIG. 5

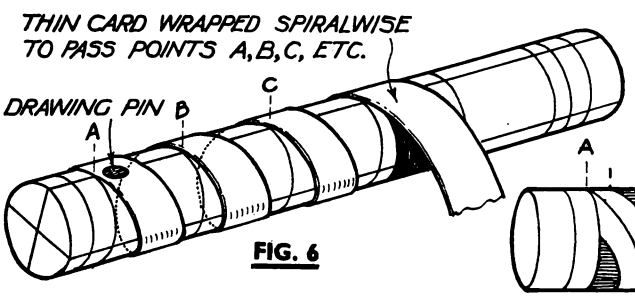


FIG. 6

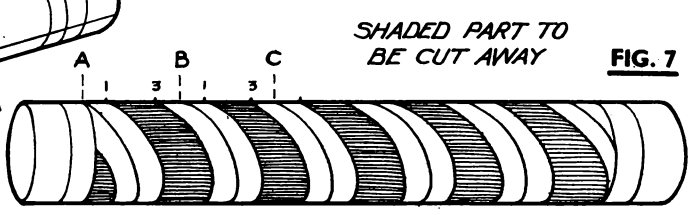


FIG. 7

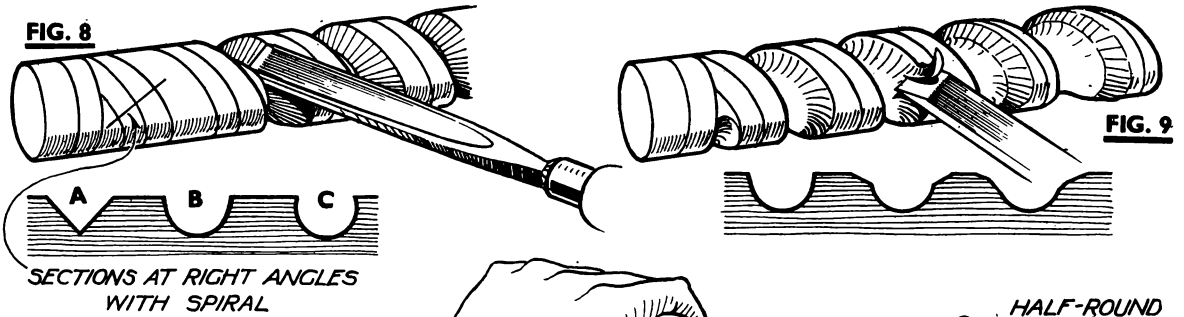


FIG. 8

FIG. 9

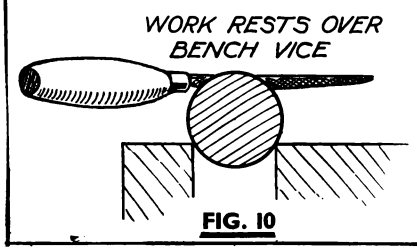


FIG. 10

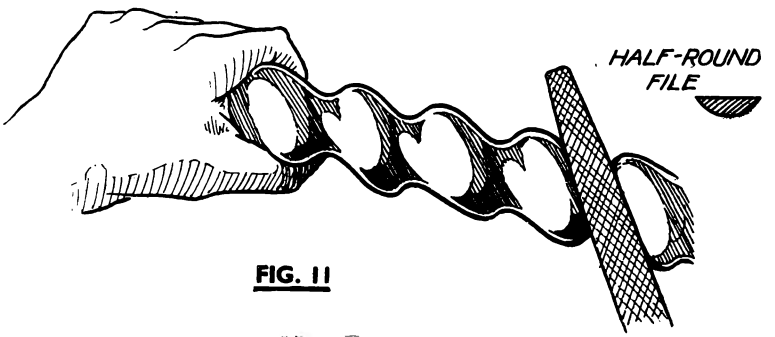


FIG. 11

FIG. 2. PITCH AND DEPTH OF TWIST. FIG. 3. MARKING THE SQUARE. FIG. 4. CORNERS PLANED OFF. FIG. 5. PRELIMINARY MARKING OF RINGS. FIG. 6. MARKING THE SPIRAL. FIG. 7. WHERE THE GROOVE IS WORKED. FIG. 8. USING V TOOL. FIG. 9. TAKING OFF CORNERS. FIGS. 10 and 11. FINISHING OFF WITH THE HALF-ROUND FILE.

FOR HOME OR WORKSHOP

TRUCKS AND TROLLEYS

For some time there has been a persistent demand for hand trucks and trolleys which, like many other commodities, appear to be growing scarce. Such trucks and trolleys are invaluable in shops or warehouses ; but now, when facilities for what may be called domestic transport are on the wane, the hand truck, hand cart, and trolley are coming to be recognised as items for home use as well.

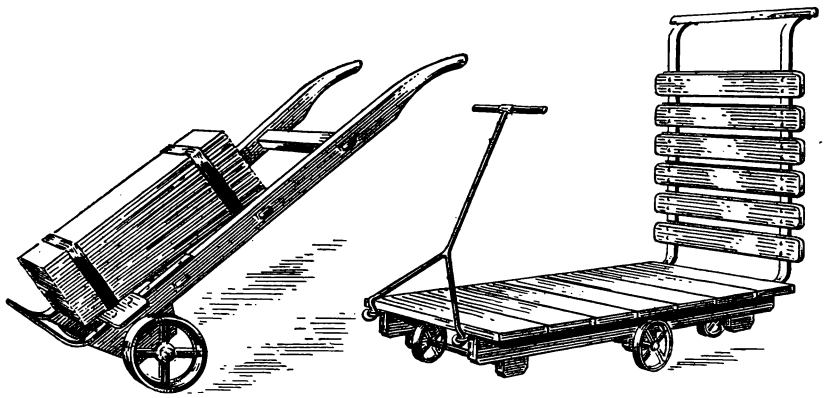


FIG. 1. THE SACK TRUCK. **FIG. 2. HOME OR WAREHOUSE TROLLEY.**

The truck has shafts of from 3 ft. 6 in. to 3 ft. 9 in. in length and wheels 8 in. in diameter. The trolley with platform 4 ft. by 26 in. or 3 ft. 6 in. by 24 in., can be made with or without upright ends. In cases where ends are dispensed with a handle (as at left) can be fitted.

THESE items have innumerable uses. They come in for the collection of firewood, waste paper, etc. ; whilst, in the absence of taxis, they are in general use for carting our luggage to or from the station, or from one temporary home to another. Many are mere makeshifts, roughly knocked together from packing cases and discarded wheels of one type or another.

THE SACK TRUCK

This is by far the most popular type and, when compared with the wheelbarrow, hand-cart, or trolley, has the great advantage of taking up very little space when stood on end. Although it must be of sturdy build it takes little timber and is easy to make.

All such trucks or trolleys, however, require metal wheels and other metal fittings, and the wheels at least should be at hand before the wooden parts are cut to size. This obvious precaution is too often neglected. At the moment rubber-tyred wheels are not available, but fortunately there are firms which can still supply sets of cast iron wheels with steel axles, bearings, etc. These can be had in different sizes and, once procured, the truck is made accordingly and the assembly is straightforward.

The sack truck—useful in so many ways—is usually from 3 ft. 6 ins. to 3 ft. 9 ins. long. Ash is the best wood for the purpose, but beech and birch are good seconds. The elasticity of ash gives it a superiority. The shafts (A, Fig. 3) will be worked from stuff 2 ins. wide by 1½ ins. thick. The end 8 ins. or 9 ins. is nicely shaped to handle form as indicated. Width across shafts is not determined until the wheels have been obtained. Wheels used are 8 ins. diameter with rims 1½ ins. wide. As, however, the rims in some cases are 2 ins. wide, the widths of 13 ins. and 16 ins. given on plan (Fig. 3) must be determined according to the distance *between* wheels when axle is fitted.

Cross bars (B) may be 2 ins. by 1⅛ ins. or 1¼ ins. Cut them with tenons which will pass through shafts and project about ⅜ in. The tenons should be wedged and the projections neatly chamfered. Sometimes the shafts are strengthened by a couple of iron rods of ⅜ in. or ½ in. diameter, bolted at one end and nutted at the other, but if the wood is well seasoned this should not be necessary unless for very heavy wear.

The blocks (C) which are bolted to the shafts carry the bearings which hold the wheels. These latter revolve on stationary axles. The blocks will be of same thickness as shaft, the width being adjusted to suit the wheels which must clear the metal guards (E) which project over them at each side.

Apart from the wheels (with their axles and bearings) the only metal parts required are the foot irons (D) and the guards (E) which any local smith can supply. Height of foot iron above the shafts may vary from 4 ins. to 9 ins. or 10 ins., according to the type of load to be carried. Note, however, that it is made and fitted so that the truck, when stood on end, will rest steadily on wheels and iron. Also allow a straight length of about 12 ins. for screwing to shaft.

The guards (E) are sometimes made as at X, being let into the shaft and screwed (along with the foot iron) from above. Others are in one piece about 4 ins. wide (as Y) finished to length required and screwed on over the foot iron. Either plan serves the purpose which is to prevent any part of the load coming in contact with the wheels.

It will be understood that the widths of 13 ins. and 16 ins. given on plan (Fig. 3) may be increased if wanted, the length of axle being ordered to suit.

WAREHOUSE OR PLATFORM TROLLEY

This useful type is made in three forms : (*a*) without ends ; (*b*) with one end ; or (*c*) with two ends. Where there are no ends a stout iron handle is provided. Sizes vary considerably. For home use the platform may be as small as 18 ins. by 12 ins.—an excellent size for a small boy. For business purposes lengths will run from 2 ft. up to 3 ft. 6 ins. or 4 ft., whilst for warehouse or platform use we find sizes up to 6 ft. by 3 ft. As the latter heavy trolleys

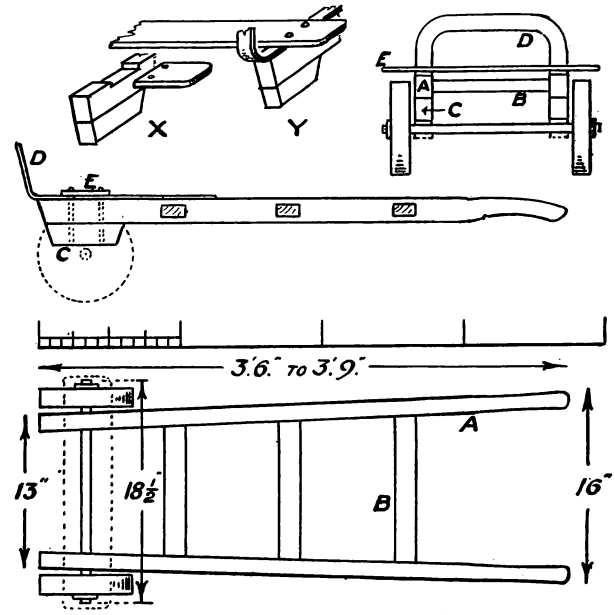


FIG. 3. SACK TRUCK : PLANS AND ELEVATIONS.

are exceptional we show an average size which might be either 3 ft. 6 ins. by 24 ins., or (as in Fig. 4) 4 ft. by 26 ins. Iron wheels from 4 ins. diam. up to 12 ins. diam. are available ; 7 ins. are usual for a 3 ft. 6 ins. length and 8 ins. for 4 ft.

A feature of this type of trolley is the *balance*. Swivel wheels for turning are not introduced. The trolley is balanced on (and turns with) the centre pair of wheels, the axle of which is set a bare half-inch nearer the ground than the axles of the single end wheels. This means that there is a slight tilt at each end, to which the load can be adjusted ; and as the end wheels are staggered as shown in plan (one to right and the other to left), turning becomes automatic. It is, of course, important (indeed imperative) that the wheels, axles and bearings are obtained beforehand, as the platform is built to fit these.

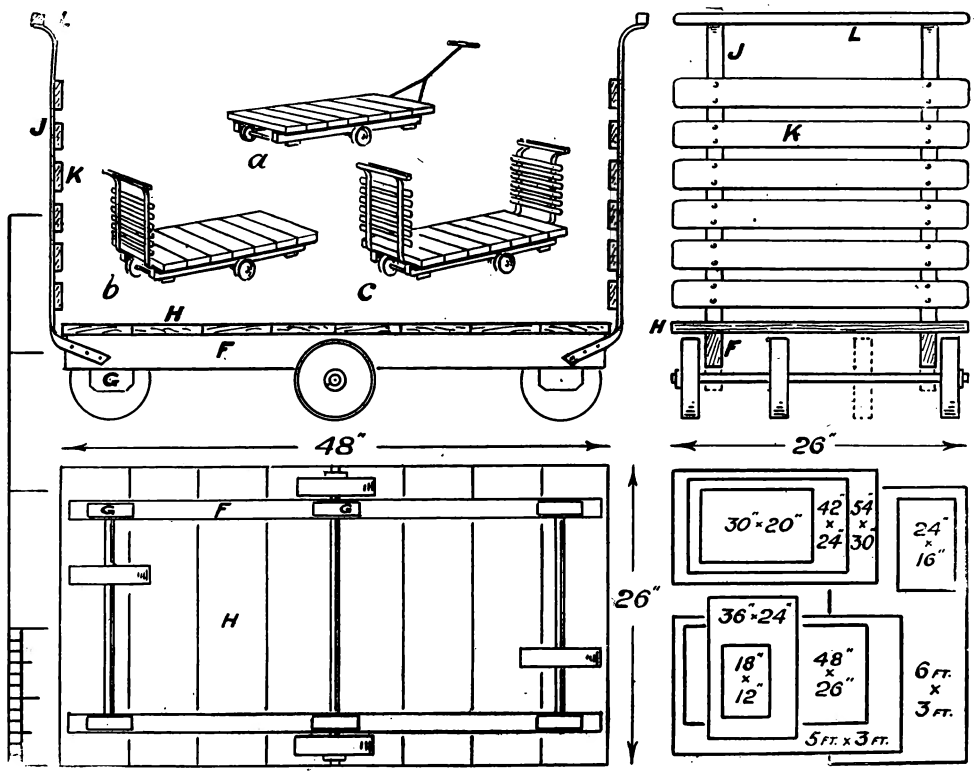


FIG. 4. HOME OR WAREHOUSE TROLLEY : SCALE ELEVATIONS AND PLANS.
At right hand lower corner is given a diagram showing the usual platform sizes of trolleys for which iron wheels are supplied.

For the bearing rails (F, Fig. 4) again use ash, birch, or beech. These should be $1\frac{3}{4}$ ins. thick, the width being 3 ins. or $3\frac{1}{2}$ ins. according to the diameter of wheel. Cut the rails so that in length they are 2 ins. less than length of platform, and note that at each side they are set in either 3 ins. or $3\frac{1}{2}$ ins. so that the platform (H) overhangs and protects the centre wheels. Two stiffening cross rails (not shown) may be fitted if desired, but should not be necessary. Platform boards (H) must be $\frac{7}{8}$ in. thick for a trolley of the size, these firmly screwed. Where, however, the bearing clamps (G) come, the rails (F) must be bored right through for bolting. Box clamps are, as a rule, provided with the wheels and axles. Platform boards will be countersunk for the bolt heads and also for the screws used.

Where ends are required the height is fixed according to the worker's needs. At Fig. 4 the height is 27 ins. above platform. The supports (J) are usually worked for T-shaped iron which does not readily yield. Particulars should be given to the smith who will work the ends for bolting to rails and also bore the parts for bolting on the laths (K) and handle bar (L). Laths will be 2 ins. or $2\frac{1}{2}$ ins. wide by $\frac{3}{4}$ in. or $\frac{7}{8}$ in. thick according to size of trolley. Handles can be worked from stuff $1\frac{1}{8}$ ins. or $1\frac{1}{4}$ ins. square. In both cases the lengths correspond with width of platform.

In the case of small trolleys without ends an iron handle (as in Fig. 1) can be made by the smith. This is held with suitable wrought eyes fitted to platform or rails, and may have a wooden bar.

Wheels, axles and bearings for truck or trolley are normally obtainable from the South London Wheel Works, 51, New Kent Road, London, S.E.1. In ordering it is wise to give (in the case of the truck) length of shaft, width over shafts at wheel end, and diameter of wheels required ; and (in the case of the trolley) length and width of platform, over-all. In order to avoid the risk of any misfit these should be procured before any wood parts are cut. (305)

TWIST LEG

(*Continued from page* 112)

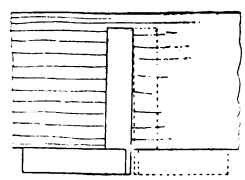
large round or a half-round file is used.

If a compound movement is adopted the high parts will automatically be taken out. The flat side of the file can be used for the rounded parts. Rest the work just above the vice as in Fig. 10, so that it can be revolved with the left hand whilst the file is used. Note from Fig. 1 how at the ends the round diminishes into the circular hollow.

Glasspaper is used finally, and it is essential that this is thorough. A shaped rubber can be used, but the fingers are also handy. Follow round the course of the spiral using first *Middle* 2 grade, then finer until you complete with No. 0. In this way you will finish with a beautifully smooth surface. (301)

BY THE WAY

The probability is that nine out of every ten metal-wood trysquares are out of truth One fall on the floor is enough to put a square out. Test on a board with a perfectly straight edge.



Cut in a line with a knife, then reverse the square. If true, it will line up perfectly.

The safest test for the accuracy of a large carcase is the diagonal strip. One end of this should be pointed. It is placed diagonally across the face and the position of the opposite corner marked. When reversed into the opposite corners the same length will register if the carcase is square.

* * *

Many joints fail because of the use of half-cold Scotch glue. Heat the glue thoroughly and heat the parts of the joint so that the glue is not chilled.

* * *

When inlaying strings and bandings allow as long as possible for the glue to set before cleaning up. It is inevitable that a certain amount of shrinkage will take place and this will draw the inlay below the surface of the wood. (227)

THE CARPENTER'S

FINDING LENGTH AND CU

A number of readers have asked for information on how to use the steel square and we therefore give this preliminary article. We hope to follow later with further articles describing how the lengths and cuts of hip and valley rafters can be ascertained.

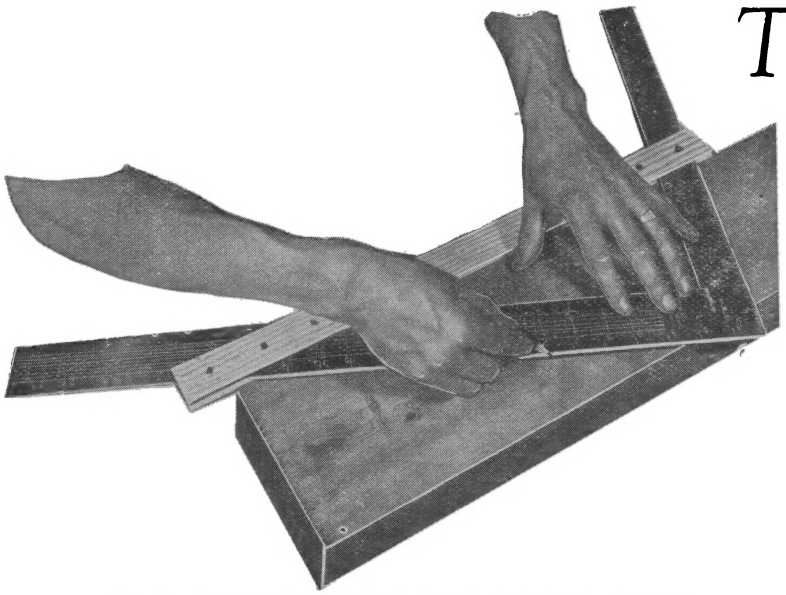


FIG. 1A. MARKING A RAFTER WITH THE STEEL SQUARE.

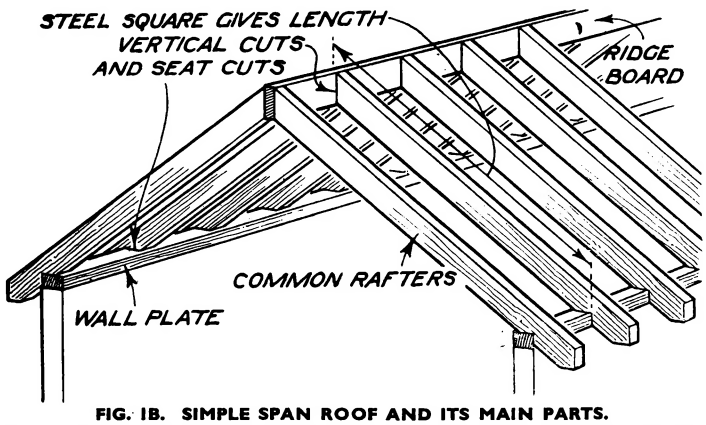


FIG. 1B. SIMPLE SPAN ROOF AND ITS MAIN PARTS.
The marking out of the common rafters is an operation which occurs in practically every type of roof. The steel square cuts out all "hit or miss" marking. Its angles are dead accurate.

THE chief use of this tool is in roofing work. It enables the various bevels or cuts as they are called to be marked out; also enables the lengths of the rafters to be ascertained. There are various makes which differ as to the tables and markings, but the broad method of marking angles is much the same in all. It functions on the principle of the right-angled triangle, and is in the form of an L, the longer arm being called the blade, and the shorter one the tongue. The blade is 24 ins. long and the tongue 16 ins. or 18 ins., and both are generally tapered in thickness from the angle outwards, this making the square light in use.

Fig. 1, A, shows the appearance of a typical square. On one side the outer edges of both blade and tongue are divided into sixteenths, and the inner edges into eighths. On the reverse side the outer edges are marked in twelfths, the inner edge of the blade into thirty-seconds, and the inner edge of the tongue into tenths. The scales we may ignore for the moment.

How the Square Works.—The important feature of the right-angled triangle is that the square on the long side or hypotenuse equals the sum of the squares on the sides forming the right angle. This is made clear in Fig. 2, and it is obvious that if you know the lengths of the sides forming the right angle you can find that of the hypotenuse. You can either measure it, or you can calculate it. By calculation it is the square root of the combined squares on the two short sides. In the present case it works out thus:

$$\sqrt{4^2+3^2}$$
$$=\sqrt{16+9}$$
$$=\sqrt{25}$$
$$=5$$

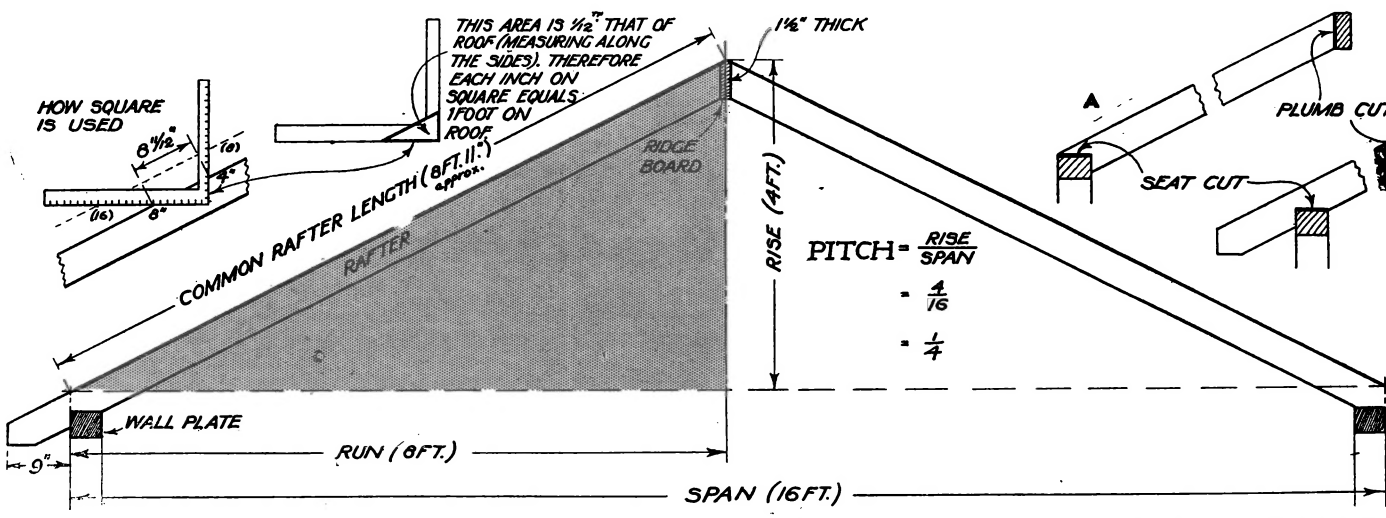


FIG. 3. SECTION THROUGH ROOF SHOWING HOW AREA MARKED ON SQUARE IS PROPORTIONAL TO THAT OF THE ROOF.
Since the square is used as a scale of one twelfth, the run 8 ft. is marked as 8 in. on the blade, and the rise (4 ft.) as 4 in. on the tongue. Measuring across these gives 8 11/12 in. The rafter length is therefore 8 ft. 11 in.

STEEL SQUARE

TS OF COMMON RAFTERS

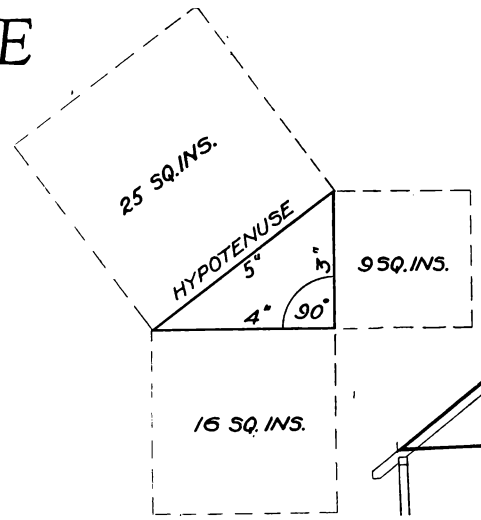
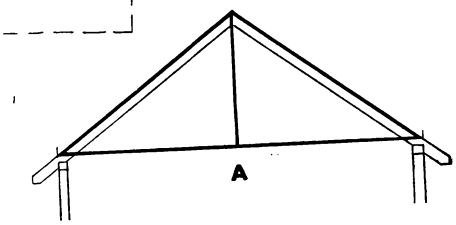


FIG. 2. HOW A ROOF, "A," REPRESENTS TWO RIGHT-ANGLED TRIANGLES PLACED TOGETHER.

This explains how the rafter length can be calculated. It is the square root of the sum of the squares on the two sides forming the right angle.



You can now see how this is applied to a roof (see A, Fig. 2). This is virtually two right-angled triangles, and since you always know the lengths of the two sides, the length of the rafters can be ascertained because these represent the hypotenuse of the triangle. Actually, the steel square largely elimihates these calculations, but it is a help to understand how it works.

Using the Square.—There are various ways in which the square can be used, and perhaps the simplest is to regard it as a scale of one-twelfth of the actual roof. In this you use the outer edges of the back of the square which are divided into inches and twelfths of an inch. Think of it in this way. If you had a big enough square you could note the lengths of the two sides and measure the distance between these two points, this giving the hypotenuse or rafter length. But obviously you cannot have a square so big, so instead you have one which is one-twelfth of the full size, so that every inch upon it (there being twelve inches to the foot) represents one foot on the actual roof. This is made clear in Fig. 3.

Terms.—At this point we should be familiar with the chief roof parts and know what they are called. The *run* is the horizontal distance from a point immediately beneath the centre of the ridge to the outer edge of the wall plate; and the *rise* is the vertical distance between a horizontal line which cuts the top of the rafter immediately above the outer edge of the wall plate and where the rafter would cut the vertical centre line at the ridge.

As in this case (Fig. 3) the run is 8 ft., and the rise 4 ft., you have only to place a rule diagonally across the square to cut 8 ins. on the blade and 4 ins. on the tongue and measure the distance. The rule should be divided into twelfths when the length can be read off immediately. It works out at practically 8 11/12ths ins., and the rafter length is therefore 8 ft. 11 ins. approx. If you haven't a rule marked in twelfths, mark the distance on a straight-edge and place this against the edge of the square with twelfth divisions. The square thus gives the length, but in addition it gives the cuts at their correct angles. The blade gives the seat cut, and the tongue the plumb cut. These terms are exemplified in Fig. 3 at A.

Overhang and Ridge Allowance.—Although the rafter length is ascertained in this way it should be noted that the wood is not cut to this size. Extra has to be allowed for any overhang beyond the wall plate, and a deduction made for half the thickness of the ridge board. Thus to mark the actual rafter use the square to mark the lower end as in Fig. 4. Since the overhang is 9 ins., shift the square to measure 9 ins. horizontally from it.

(*Continued on page* 119)

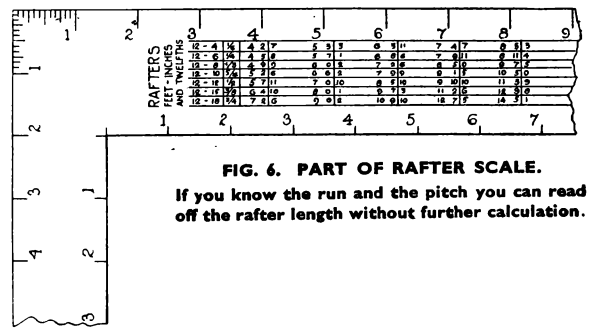


FIG. 6. PART OF RAFTER SCALE.

If you know the run and the pitch you can read off the rafter length without further calculation.

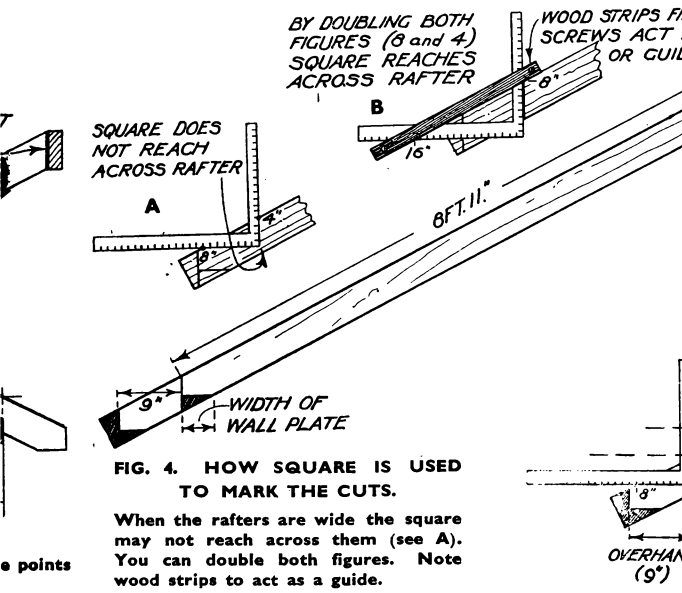


FIG. 4. HOW SQUARE IS USED TO MARK THE CUTS.

When the rafters are wide the square may not reach across them (see A). You can double both figures. Note wood strips to act as a guide.

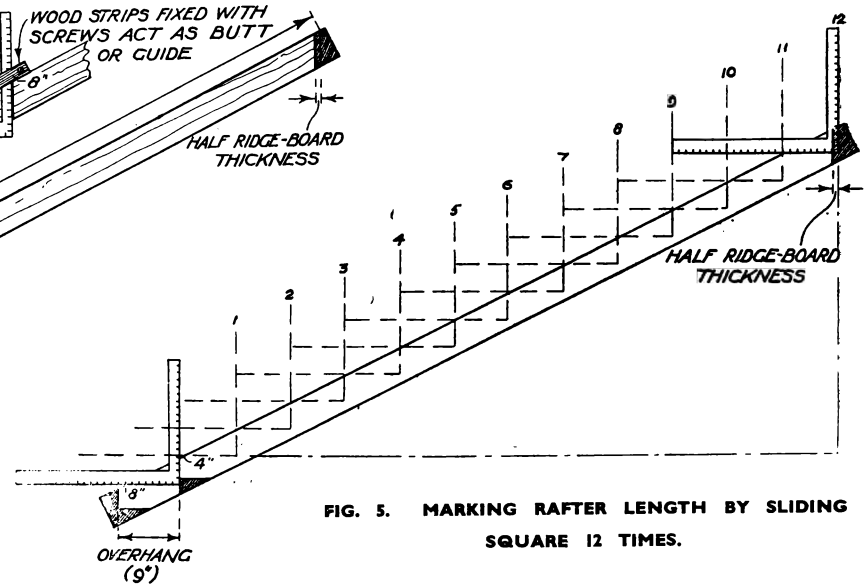
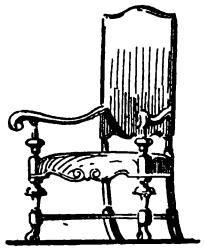


FIG. 5. MARKING RAFTER LENGTH BY SLIDING SQUARE 12 TIMES.



FEATURES IN FURNITURE

In this series of articles the writer selects various parts of furniture ; panels, mouldings, turnings, and so on and discusses how they came to develop or decline during the periods of our furniture.

1. THE ARCHITECTURAL TRADITION

FROM time immemorial primitive man had an instinct to ornament his weapons and tools, but it was long before he turned his attention to the decoration of his home. This was not his sphere. Thus the interest which attaches to the development of early furniture lies in the struggle towards utility rather than in any aim at form or decoration. Instinctively man groped for what was needed, erecting pieces which met the requirements of the moment. It was only when, later, he became conscious of comparative wealth, that necessity ceased to be the prime factor, and a dawning sense of ease led him to consider comfort and beauty. Luxury followed wealth, and when the Renaissance heralded a new era furniture threw off its primitive garb and became an object to which the finest craftsmanship was devoted.

Firstly it changed in form : utility was no longer the sole aim. A seat need not be merely a crude bench. A chest need not be laboriously hollowed from a tree trunk ; it could be built, and in time it could develop into a cupboard or wardrobe. For ideas in form man naturally turned to the stone structures he saw—temples, abbeys, monasteries, and other buildings. Hence the introduction of what may be termed architectural features in furniture. The forms were there to be adapted : columns, arches, friezes, pediments, plinths, mouldings, all possible in timber as well as in stone. And thus began a tradition which lingered till a generation ago. Our museums are crowded with rich specimens of furniture, covering several centuries, many of which might be called miniature examples of architecture.

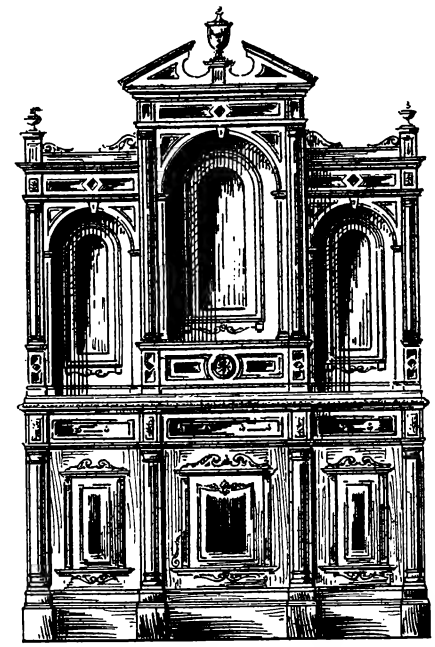


FIG. 1. RENAISSANCE CABINET.

This is some 5 ft. 6 in. wide and stands 8 ft. 9 in. high. Note the architectural features such as the heavy plinth, fluted columns, arched alcoves, entablature, and pediment.

Architectural Details.—By " architecture " in furniture is meant form rather than decoration. Carving, inlay, marquetry, painting, and the introduction of ormolu and other mounts are accepted as decoration pure and simple. Features such as columns and arches, borrowed from the sculptor in stone, are not structurally essential in wood. The ornamental arches in Fig. 1, for example, are not constructed like roof trusses ; they are purely decorative—imitations of stonework—and do not carry the weight of the superstructure.

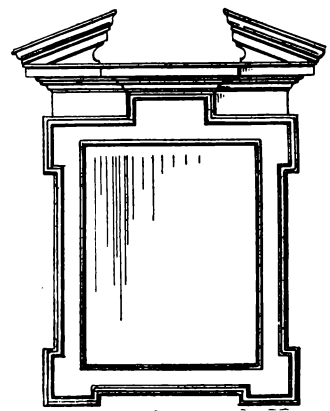


FIG. 2. EARLY 18th CENTURY MIRROR.

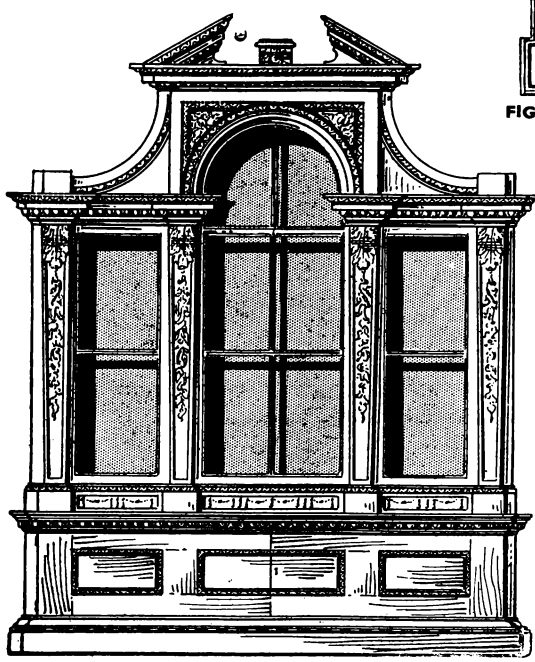


FIG. 3. CABINET MADE IN GEORGE REIGN.

All these architectural forms, however, are accepted as decorative features of an early age, features, too (in the case of freizes, cornices, plinths, etc.) which have come down to the present day. Nor can they be idly condemned as incongruous and obsolete. If we to-day have departed from them we know that this is due to sheer economic necessity. Circumstances drove us to abandon all superfluities simply because they absorbed more timber than was necessary and thus cost too much to produce. Admittedly large cabinets such as Fig. 1 may oppress by their sense of heaviness, but we must bear in mind that they were made for spacious apartments which permitted of their dimensions.

Columns (Fig. 4), when used, were sometimes full circular in section and sometimes three-quarter circular. Sculptured wood figures were frequently substituted, these chiefly in the earlier examples. Apart from cabinets and sideboards, columns were common on chimneypieces and other fitments, twin pillars frequently being introduced. As a substitute for the column, the pilaster (Fig. 5) became a highly decorative feature which the Adam brothers made use of to full advantage. On lighter furniture these were simply fluted, but when wider they would be panelled and often carved and fitted with moulded plinth and cap. The

shaped truss (Fig. 6) gave a bolder effect and is often found on chimneypieces, consoles and also on old sideboards. In our own day it was a common feature on pianos. The face as well as the sides was often richly carved.

Arches (Fig. 7) sometimes sprang directly from columns or pilasters, and at other times from corbels as indicated. The The introduction of a " keystone " enabled the wood craftsman to copy his brother mason faithfully if not intelligently. The broken pediment (Figs. 1 and 7) was a feature favoured by Robert Adam (note also Chippendale's curved pediments), and throughout last century found a place on many wardrobes and tall sideboards and bookcases. Adam, indeed, did much to prolong the architectural tradition, and few will assert that he lowered the dignity of furniture form. The high plinth was also borrowed from models in stone, and when furniture of the old days was taller than it is to-day the deep base was necessary in the interests of proportion.

(304)

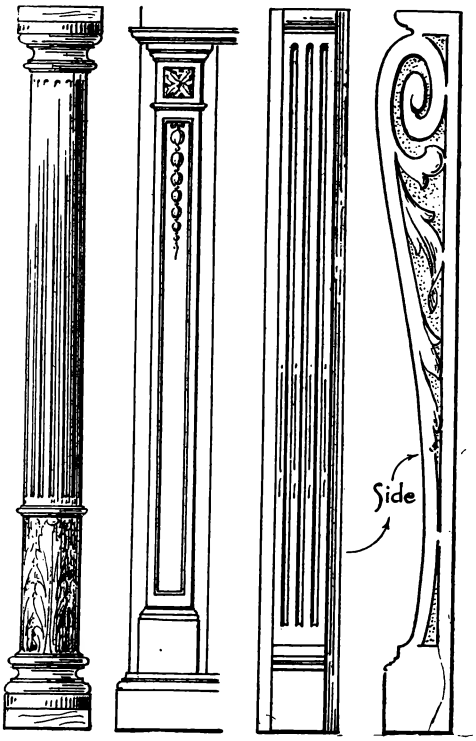


FIG. 4. FLUTED COLUMN.

FIG. 5. PANELLED PILASTER.

FIG. 6. SHAPED TRUSS: FRONT AND SIDE.

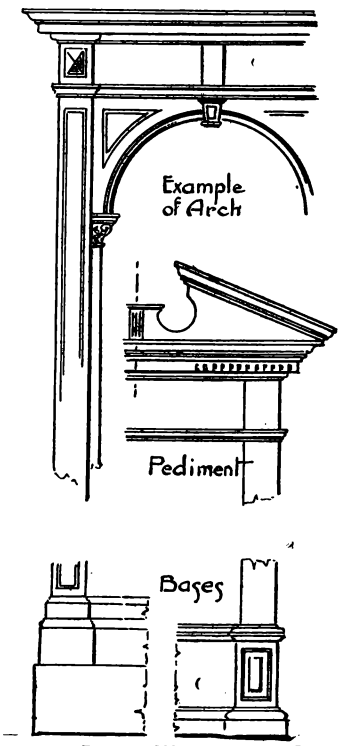


FIG. 7. WOODEN ARCH. PEDIMENT, BASES.

STEEL SQUARE

(*Continued from page* 117)

Mark in the birdsmouth joint where it fits over the wall plate, continuing the vertical line to the top. Measure out the rafter length from this point, and at the top slide the square so that the upright is horizontally $\frac{3}{4}$ in. (half the ridge thickness) short of the length. Fig. 4 makes this clear.

Sometimes there is a complication in that, with the dimensions given, the square will not reach right across the wood as at A, Fig. 4. In this case you can either mark the cuts with the 8 in. and 4 in. held at the bottom edge of the wood, or you can double both figures as at B. Note that it is a great convenience to fix a couple of parallel wood strips to the square with screws. These bear against the wood and enable the exact angles to be maintained.

Sliding the Square.—Instead of measuring across the square you can slide the latter along the rafter if you prefer as shown in Fig. 5. Since the square represents a scale of one-twelfth you have to slide the square twelve times. If you have set the square to double figures (16 and 8) for convenience in reaching across wide wood, it must be reset to the correct figures of 8 and 4 when sliding the square. The addition for the overhang and deduction for the ridge are then made. Naturally the accuracy depends upon the care taken in sliding the square, because the possibility of error occurs twelve times, and generally the more satisfactory way is to measure the distance in the way already described, although this is not perfectly accurate, as we shall see.

Use of Scales.—There is yet another way to find the length, and that is to use the scale on the square. This varies with different makes of squares, and the instructions supplied with the square should be followed. In the *Sargent* square, which is exemplified here, the scales are based upon the roof *pitch*, and this is a thing we should now understand. *Pitch* is the ratio between the rise and the span, see Fig. 3. The rise divided by the span gives the pitch. Thus in Fig. 3 the rise (4 ft.) is divided by the span (16 ft.); that is: 4/16ths = $\frac{1}{4}$ span.

In a roof having a span of 18 ft. and a rise of 6 ft. the pitch would be $\frac{1}{3}$. The pitch does not always work out exactly to a simple fraction like this. but the scales are the pitches most commonly used in roof work: $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{5}{12}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$.

The rafter scale is on the blade at the back where the twelfths occur, and is used in conjunction with these edge gradations. The figures given are based upon the run of the rafter. To take the actual example in Fig. 3, the run is 8 ft., and the pitch $\frac{1}{4}$. The various pitches are given at the inner end of the scale. Take the line of the $\frac{1}{4}$ pitch and follow it along until you come to the figures beneath the 8 on the outer gradations. You will read 8-11-4, which are translated as 8 ft. $11\frac{4}{12}$ ins., and this is the common rafter length.

It will be recalled that when using the square as a $^1/_{12}$ scale and measuring the hypotenuse we found the length to be 8 ft. 11 ins., this being $\frac{1}{4}$ in. shorter than that just found. This is due to the impossibility of measuring the hypotenuse length to a fine fractional estimate, and since the square is a $^1/_{12}$ scale any inaccuracy is multiplied twelve times. Even so, it is only $\frac{1}{4}$ in. out in a rafter length of nearly 12 ft.

To take another case, a roof has a pitch of $\frac{3}{4}$ and a run of 6 ft. The rafter length is 10 ft. $9^{10}/_{12}$ ins.

Should there be an odd number of inches in the run the figures are regarded as inches and twelfths instead of feet and inches. Taking an example of a roof with $\frac{1}{3}$ pitch and a run of 7 ft. 5 ins., look under the 7 edge gradation along the $\frac{1}{3}$ line and you will find the length 8-5-0 (8 ft. 5 ins.). Now turn to edge gradation 5 and you find 6-0-2. This is read as 6 ins. Thus the rafter length is

8 ft. 5 ins.
6 ins.

8 ft. 11 ins.

One more example, the roof having a $\frac{5}{8}$ pitch and a run of 8 ft. 7 ins.

Run of		rafter length
8 ft. = 12-9-8	=	12 ft. $9^8/_{12}$ ins.
7 in. = 11-2-6	=	$11^2/_{12}$ ins.
		13 ft. $8^{10}/_{12}$ ins.

(310)

If a very thin brass screw has to be driven into hardwood it is advisable to put in an iron screw of the same size first. Thin brass screws are liable to break off under pressure. Once the iron screw has been driven home and withdrawn the brass one can be entered with safety.

It is always advisable to cut a haunch on a tenon, even when there is no groove to be filled in. It prevents any tendency for the edge to twist.

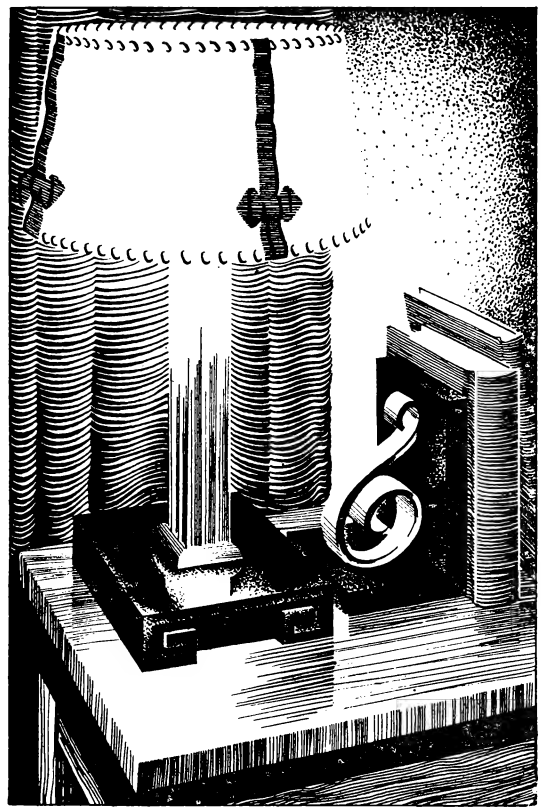


FIG. 1. IDEAL FOR TABLE OR SIDEBOARD.
This would look most striking with a silvered column and ebonised base. Height over column is 1 ft. 3 in.

LIGHTING THE HOME

TABLE LAMPS

Two alternative designs are given. Type "A" is a formal design making a decorative focus for sidetable or bookcase, while "B" is a smaller and simpler type also suitable for a bedside lamp. In type "A" the fluted column is intended to be silvered, contrasting with a black base; "B" is for hardwood with a waxed finish or could alternatively be painted.

TYPE "A"

THIS is shown in Fig. 1.

The column.—For this you need two pieces of close-grained hardwood such as basswood or beech to finish 2 in. by 1 in. Plane a face on each and glue together, one piece being previously grooved down the centre and a piece of string inserted so that the flex can be pulled through after assembling. When the glue is hard plane down to 2 in. square, level the top, and rebate the bottom $\frac{1}{4}$ in. all round to form a tenon, the shoulders being set $\frac{1}{2}$ in. above the base to receive the moulding.

It would be possible to work the flutes with a carving gouge and finish them with glasspaper on a block shaped to fit the hollow. The method shown here involves the use of a scratch-stock, a tool which is well worth making, if you have not one already, as it can be used for all sorts of little grooving jobs, "sticking" beads, and even simple mouldings.

The enlarged detail shows it in side elevation and plan; it consists of a piece of hardwood about 1 in. square with a saw-cut down the middle to take a cutter and a cross-piece or fence at the end. The bottom is slightly rounded to reduce friction, and the end bored to take a bolt so that the fence may be reversed with the rounded face inwards for working round curves. The cutter is held by screws at both sides, and is made from a piece of hack-saw blade ground to the profile and finished with a square edge like that of a scraper. A further refinement would be to make a mortise to take the cutter, instead of the saw-cut, and to have the bolt for the fence running in a slot to give various adjustments. Use the scratch-stock like a cutting gauge, working up and down the edge until sufficient depth is reached. All the outer flutes can be made with one setting of the cutter, which is then moved along to the position for making the middle flutes.

The Base.—If this is to be ebonised any close-grained hardwood will serve, but if you have an odd piece of a decorative wood such as rosewood or macassar ebony this will be an attractive alternative. The bottom is rebated $\frac{3}{8}$ in. to form two feet and a central mortise cut to receive the tenon of the column. The square scrolls on the face are shown drawn out on $\frac{1}{8}$ in. squared paper to give the proportion and are set out with marking gauge and knife, the rounded hollows in the section being cut with a gouge—a small "bent" gouge will also be useful for clearing the ground.

Before assembling, make a saw-cut at either side of the tenon to receive glued wedges after it is driven home, the wedges being at right angles to the direction of the grain of the base.

Ebonising and Silvering.—If you are having the ebonised base first stain it black using a paste filler, body up with French polish to which aniline black and a little washing blue has been added, and finish off with white polish and spirit. For the column use a good quality silver paint finished with clear varnish or cellulose lacquer.

The fitting is completed by tying the flex to the string and pulling it through the shaft, connecting up with a flat-base lampholder with switch screwed to the top.

TYPE "B"

The Ring.—For this you will need a piece of hardwood $\frac{13}{16}$ in. finished by 6 in. square. Cut the ring with a bowsaw, finishing with a spokeshave, the circular piece from the middle being cut in half and glued to either side of a central block to form the base. A groove for the flex is cut in the ring, and after a string has been inserted, is covered by the facing piece, the string being led out through a hole in the front of the base. The ring is flattened at the bottom to bed down to the base, to which it is fixed by gluing and screwing from below.

A metal bush for fixing the lampholder is let into the top of the ring; the threaded cap from an ordinary hanging lampholder would serve for this if a bush cannot be obtained.

Alternative Base.—An alternative base is shown on the right of the working drawing, with this the ring will need only an $1\frac{1}{2}$ in. flat at the bottom. The stability of both types of lamp will be improved by weighting the bottom. If scrap lead can be obtained, melt it and cast into flattish cylinders (in holes bored in an odd piece of wood) and bore holes in the underside of the base to fit, fixing with screws.

Cutting List.—Finished sizes are given here, so allowance for cleaning up must be made:

TYPE "A"

	Pieces	Long ins.	Wide ins.	Thk ins.
Column	2	$14\frac{5}{8}$	2	1
Base	1	7	7	2
Base Moulding	4	3	$\frac{3}{4}$	$\frac{1}{2}$

TYPE "B"

Ring, back and front of base	1	6	6	$\frac{13}{16}$
Facing ring	1	6	6	$\frac{1}{4}$
Centre of base	1	$3\frac{3}{4}$	$1\frac{1}{2}$	$\frac{1}{16}$

(302)

RODNEY HOOPER

The War Effort.—The climax which we now see in the war means that paper salvage is more necessary than ever. It is perhaps a curious thought that our troops carry abroad with them vast quantities of paper in the form of equipment of all kinds. Please then continue to set by your weekly bundle for the collector.

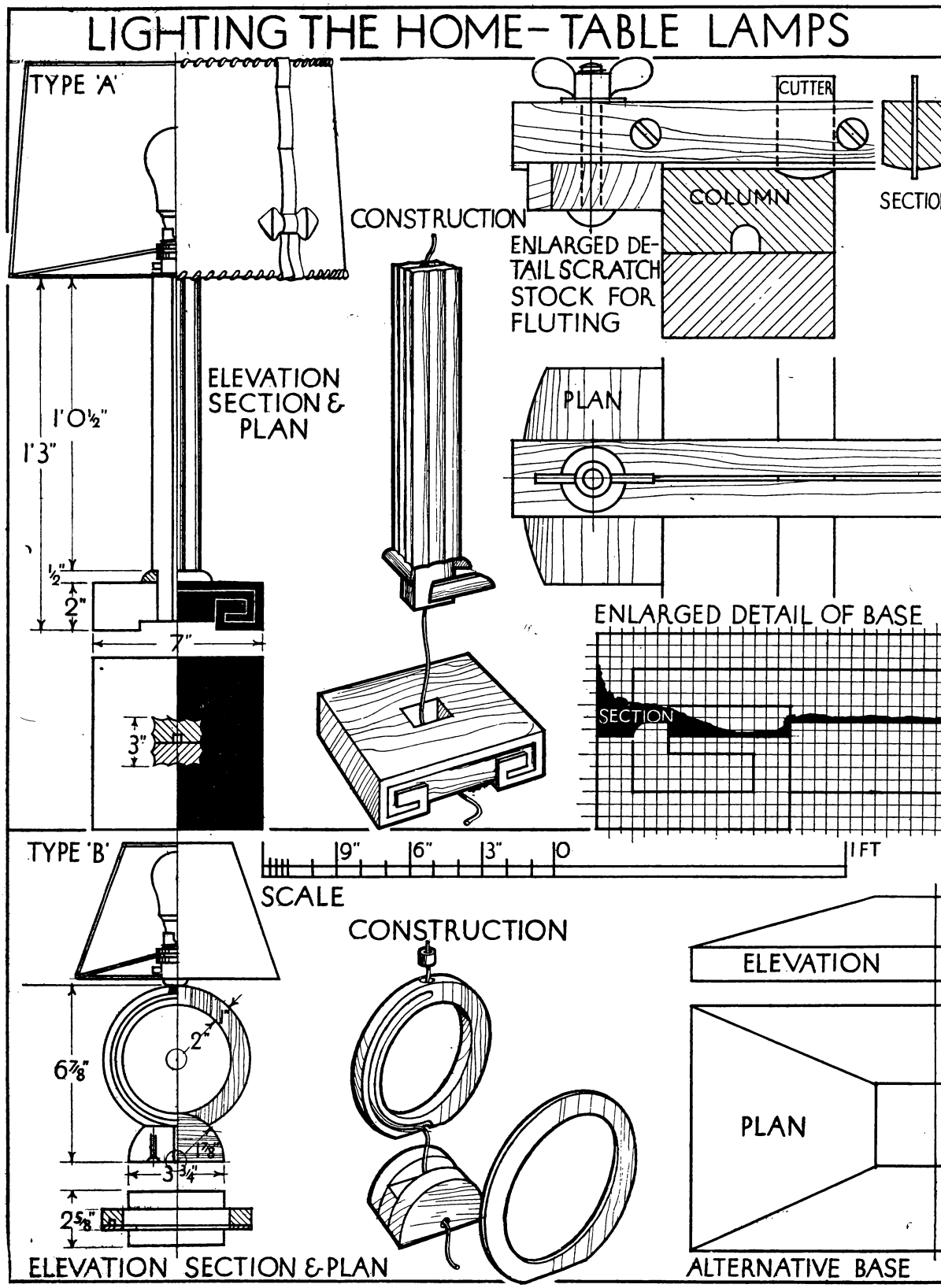


FIG. 2. SCALE ELEVATIONS WITH MAIN SIZES, AND DETAILS OF CONSTRUCTION.

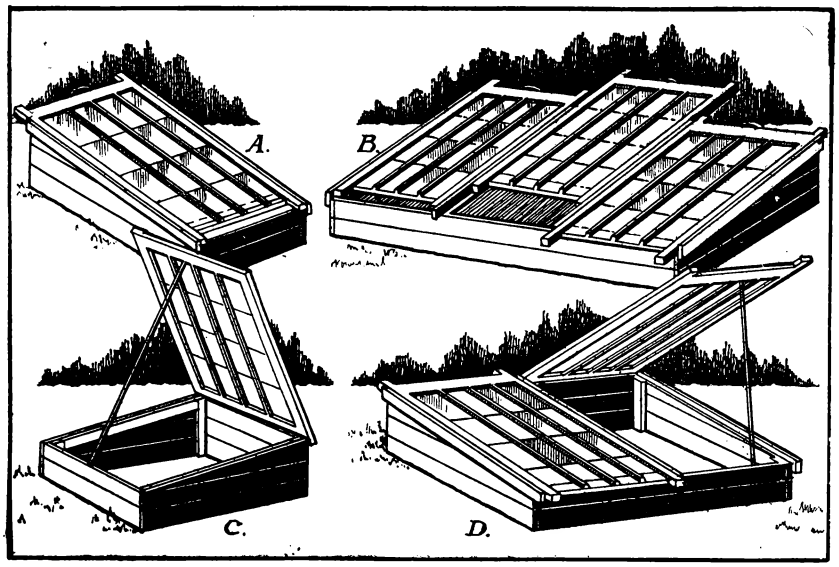


FIG. 1. TWO TYPES OF FRAMES IN VARIOUS SIZES.

Both sliding and hinged types are equally satisfactory. Size can suit personal requirements. See Figs. 2-11 on opposite page.

GARDEN FRAMES

THERE are two types of garden frames—those with sliding lights, and those with hinged lights. Although there is little to choose between them the sliding type is, perhaps, favoured by the professional gardener, but single or even double-hinged light frames are satisfactory and are preferred by many amateurs.

In the choosing, some consideration should be given to the position the frame will occupy. It should of course face south, but if there is a wall or fence at the back (which will naturally give added protection), then the hinged type is certainly the best because an hinged light may be opened for ventilation where a sliding light cannot. It is probably the question of space which causes the amateur to favour the hinged light.

Types.—Fig. 1 (A) shows a single frame with a sliding light; (B) a frame with three sliding lights; (C) a single frame with hinged light; and (D) a double frame with hinged lights. Almost any kind of wood 1 in. thick may be used for the frames, but deal of course is most easily worked. Fig. 2 shows a frame for two sliding lights, and from its description it will be simple to make a single or three-light frame.

The standard size adopted for lights is mostly 4 ft. wide by 6 ft. long, but it is not necessary to always use these dimensions. In determining the size of the two-light frame (Fig. 2) the length is calculated by the width of the two lights plus 1 in. the thickness of the middle guide-piece which is fitted between them, while the width of the frame should be arranged to allow 1 in. overhang of the lights at both the front and back. Thus for two 6 ft. by 4 ft. lights the frame should be 8 ft. 1 in. long by 5 ft. 10 in. wide at the top. The depth may be from 1 ft. to 1 ft. 6 in. at the front, and 1 ft. 6 in. to 2 ft. at the back.

Making the Frame.—The two ends (Fig. 3) of the frame should be made first. Boards to make the size and shape are held together with battens nailed 1 in. in from the front and back edges. The top ends of the battens should stand ¼ in. below the top edges of the ends, and it will be an advantage if a weather groove is worked along these edges, as shown at Fig. 4.

Anyone taking up gardening even as an amateur soon realises how important and necessary a garden frame is. This is also shown by enquiries asking for the description of a reliable but simply made frame. Many only require a single light frame, but others wish to make two or even three light frames. Some already possess the necessary lights and wish to make frames of special sizes to receive them, but others who are not so fortunate will find no difficulty in making the lights themselves. The whole matter of garden frames is treated fully in this article, and will be appreciated by the ever-increasing number of gardeners amongst our readers.

The front and back of the frame is also made with 1-in. boards which fit between the ends and are nailed to the battens at their edges. To accommodate the double lights a runner 3 in. wide is carried across the middle of the frame, to which it is lapped and nailed as shown at Fig. 5. Weather grooves should again be cut in the runner, and a guide-piece 2 in. deep is nailed above. Battens 3 in. wide are nailed across the front and back under the runner. Finally guide-pieces 4 in. deep are nailed across the ends on the outside to stand 2 in. above their top edges. From this description it will be simple to arrange for one, two, or three light frames.

Hinged Light Frame.—A frame for a single hinged light is shown in Fig. 6, and it is made with two ends joined by front and back boards as before. Size is arranged by allowing a 1 in. overhang for the light all round. The ends (Fig. 7) are made with boards cut to the required size and held together with battens nailed 1 in. in from the front and back edges, with another batten fitted between these battens and standing down about ¼ in. from the top edges of the ends.

Again it will be advisable to work weather grooves along the top edges, (see Fig. 8 for details). The front and back are nailed to the battens on the ends as before, and a hingeing batten is nailed across the top edge of the back. If a double frame is desired, the necessary length is allowed, and a middle batten (or runner) and guide-piece is fitted as in the whole frame for the sliding lights previously described.

Lights.—A light suitable for these frames is shown in Fig. 9, deal 2 in. thick being used for making. Top rail should be 4 in. wide, stiles 2½ in. wide for sliding light and 4 in. for hinged light, bottom rail 4 in. wide but only 1½ in. thick, and astragals 1½ in. wide. The top rail and stiles should be rebated and chamfered ½ in. on the inner edges and the astragals on both edges, but the bottom rail is only chamfered on the inner edge, while weather grooves are run on the outer bottom edges, details being shown in the sections in Fig. 10.

The top and bottom rails are tenoned into the stiles, the joints being mitred into the depth of the rebates and chamfers, and the face of the bottom rail is kept level with the rebates to allow the glass to fit over it. The astragals are tenoned into the top rail and run over the bottom rail, where grooves ¼ in. deep are prepared for them, details being shown in Fig. 11. If a frames smaller than 6 ft. by 4 ft. is being made it would be possible to reduce the thickness of the light to 1½ in. Glazing should be with 21 oz. glass, and two or three coats of paint applied. (303)

HOME MADE LATHE

A reader has asked advice regarding a lathe he is making.

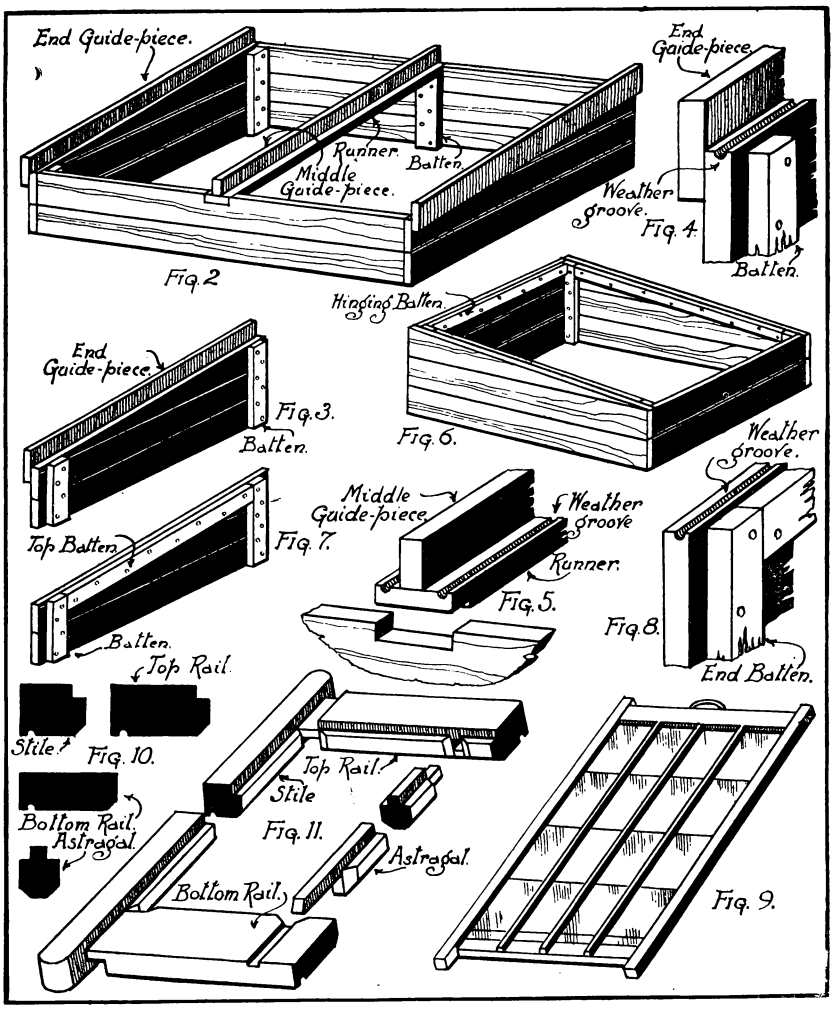
Reply.—You do not state the speed or horse power of the motor. As the size of the lathe you propose to make will take diameters up to 11 in. (approximately) some considerable power will be required somewhere in the region of ½ h.p. The most satisfactory means of power transmission is an overhead motion, shown in Fig. 1. The overhead motion is supported from the roof in brackets which could be constructed similarly to the lathe standards shown in Fig. 2. It is usual with overhead motions to arrange fast and loose pulleys so that the motion of the lathe can be readily stopped, but this can only be done, conveniently, if a flat belt drive is employed. With the arrangement shown, we would suggest that a switch be fixed close at hand so that the power can be quickly cut off.

In Fig. 2 we have shown a simple form of standard construction, the method of jointing the members being illustrated in Fig. 3. The top of the braces are best secured with coachbolts which will permit of tightening should any looseness occur. At the headstock end, the standard is continuous above the bed and carries one of the bearings for the pulley core. The other part of the headstock is shown in Fig. 4, and it will be noted that a tenon-like projection is provided which fits in the gap in the lathe bed. The tailstock is similarly made.

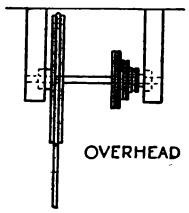
Both the tailstock and the headstock part shown in Fig. 4, are secured to the bed by bolts which screw into nuts housed in slots cut in the tailstock and headstock part. The tailstock screw is threaded into a plate which is attached to the tailstock by woodscrews.

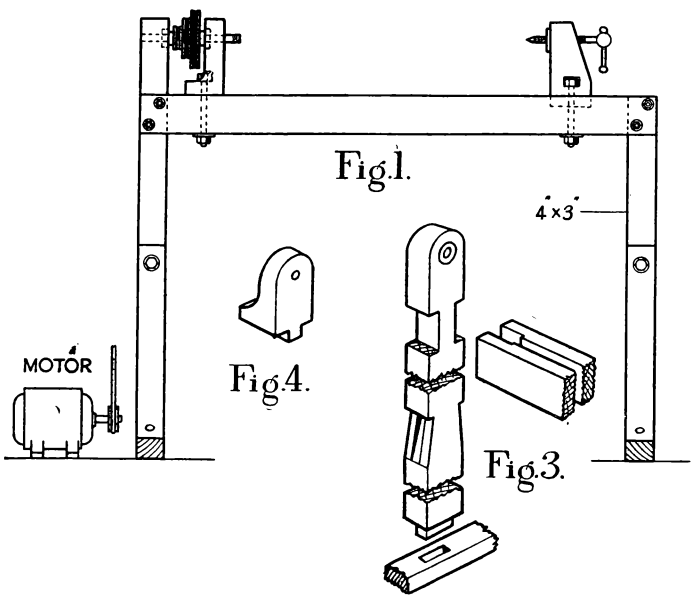
If possible a hardwood should be used for the bed and tailstock, also the part shown in Fig. 4. The other parts could be constructed from good quality deal.

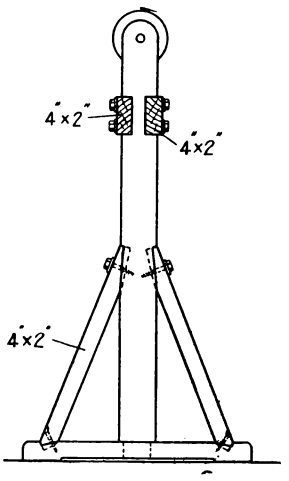
(308)



CONSTRUCTION OF THE FRAMES AND THEIR LIGHTS. (See opposite page)







ELEVATIONS OF LATHE AND GENERAL DETAILS OF CONSTRUCTION.

?———*The Question Box*———?

In these columns we endeavour to help readers in practical difficulties.

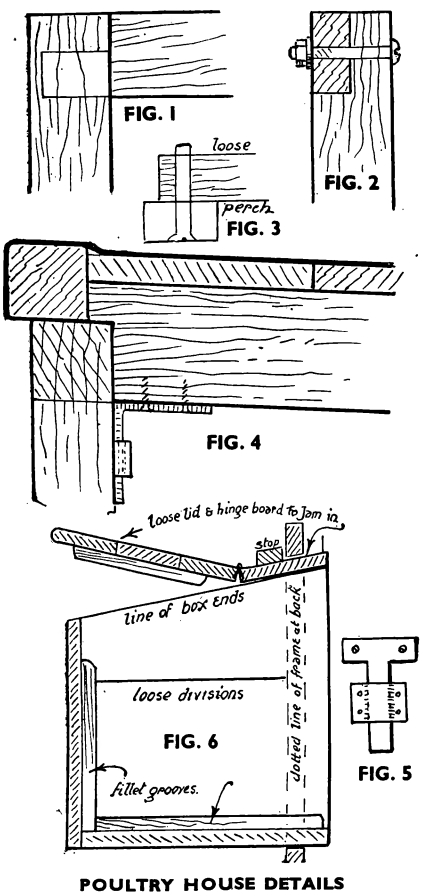
REGULATIONS

Each query must be accompanied by a stamped addressed envelope.
A coupon from page iv. of cover must be enclosed.
Full particulars must be stated, and, if possible, a rough sketch sent.
Only problems connected with woodwork can be dealt with.
Special designs for individual requirements cannot be prepared.

Queries should be addressed to: The Editor, WOODWORKER, Montague House, Russell Square, London, W.C.1.

NEST BOXES **W. W. (Bradford). Regarding the Poultry House design given in the April, 1939 (Woodworker), I should be grateful for more details of joints, nest boxes, etc.**

Reply.—Both ends of the structure are alike, fitted with a three-light window covered with wire netting. Joints for the framework are given, uprights being put together by a plain tenon as Fig. 1, or held by halving together and bolting with galvanised bolts and nuts, Fig. 2. The roof has four 3 in. by 2 in. rafters cut to butt against a top back rail at front of house and the rail nailed above it up to which the rough boards are fixed as indicated. At the back end the rafters are bridled on to the uprights and bolted, the uprights being prolonged for the purpose with the inner rails halved to them and nailed or screwed. The roof can be further held by any suitable form of haft and staple, as noted Figs. 4, 5. The uprights are slightly advanced over the joist lengths so that rainfall may drop clear into a soak-away provided, but both uprights and rails still will have a bed upon them.

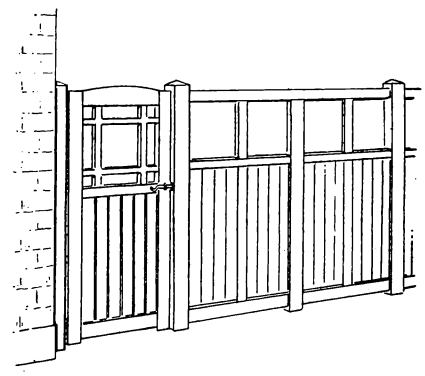


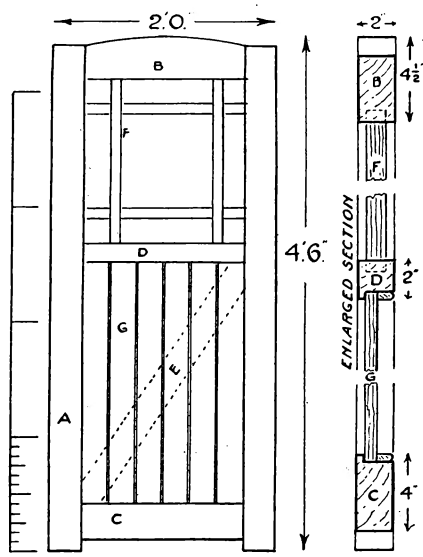
POULTRY HOUSE DETAILS

The nest boxes are detachable, fixed at ends to the respective uprights by means of a hook and eye attachment, as in Fig. 5. At the same time there is nothing to prevent your fixing these boxes permanently if you so desire by screwing to the frame backing them. The boxes are not passed through this frame into position from the inside but are hung in position from the outside by means of the hooks and eyes after they have been entered sufficiently to project on the inner side of the frame and so obtain an extra safe bearing. A loose lid and hingeing board are provided as in Fig. 6. The board has a fillet nailed to it to form a stop, and when pushed home between the top rail of frame and the box ends jams the box tight into position, whilst allowing it to be released quickly for cleaning.

Fig. 6 notes how the grooves for divisions between the nests are made so that they are also loose for removal and cleaning, but these can be dispensed with and separate boxes provided to drop into each containing box instead to facilitate sanitary attention. It will be seen that the back of the containing box sides must be of a height to fit the frame opening less the finished thickness of the board only, whilst the latter may be very slightly tapered to assist its entry and hold between. Six birds are provided for in the nesting boxes and the perches for them may be one, two of three at your choice of position. Fixing can be made to a slotted block or the perch can be holed at each end to drop on to a peg or screw fixed in a block, Fig. 3. (306)

Note for Overseas Readers.—The fact that goods made of raw materials in short supply owing to war conditions are advertised in this magazine should not be taken as an indication that they are necessarily available for export.



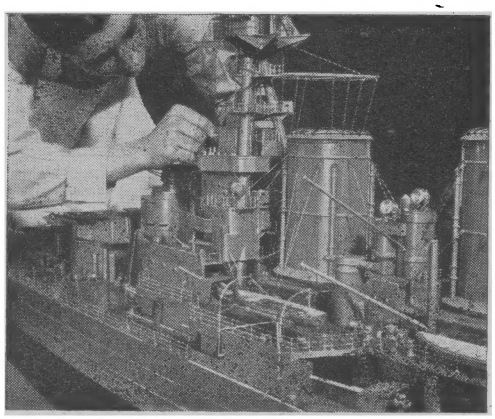


GARDEN TO YARD GATE, 4ft. 6in. by 2ft.

REAR GARDEN GATE **J. McM. (Carlisle) has a back yard which leads to the garden. This he is screening with a wooden fence as indicated, 4 ft. 6 ins. high, and he asks for a design for a strong gate to match, the width of which should not exceed 2 ft.**

Reply.—On the lines shown, your gate might be 4 ft. 6 ins. by 2 ft., this arranged to correspond with the dimensions you give. For a durable gate in the birch you have, the widths and thicknesses of parts may be these: For stiles (A) 3½ ins. by 2 ins.; top rail (B) 4½ ins., including curve, by 2 ins.; bottom rail (C) 4 ins. by 2 ins.; mid rail (D) 2 ins. by 2 ins.; strut (E) 3 ins. by ⅞ in.; upper fillings (F) 1⅛ in. square; boarding (G) ¾ in.—widths as convenient.

Rails will be through-tenoned to stiles and painted in. Filling bars (F) may be stub-tenoned or let in to their full thickness. Strut (E) will be notched in and the lower boards beaded. As shown the gate should be in keeping with your screen. Strap or stout butt hinges may be used, these (preferably, we should say) at the wall side. Make sure, however, that the shutting post supporting the screen is firmly fixed. (307)



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Mark Your Tools.—Apology. Messrs. EYRE & BAXTER, 55, Brown Street, Sheffield, regret delay in executing orders for name stamps owing to pressure of Government contracts. Future orders will take at least 13 weeks to execute.

Inlay Bandings.—Lines and Strings in various sizes and patterns. —Below.

Veneers are essential to perfect modern designs. Any quality veneer supplied. Stamp for list.—J. C. LIPPIATT, 2, Avenue Rd., Brentford.

French Polishing.—Thoroughly practical tuition by post in all processes. See our list of pupils placed in well-paid positions.—Bakes, 15, Jesmond Avenue, Bradford.

Wanted.—Driver 24-in. Scroll Saw; 4-in. Planer, Jointer, Rebater; 10-in. Bandsaw; Zyto Treadle Bench with all accessories.—R.A.Y., 44, Sandy Way, Walton-on-Thames, Surrey.

Handicraft Teaching.—Craftsmen, Wood or Metal, prepared for examinations by correspondence coaching. Special terms for men in the fighting services. Government grant available.—MARRIOTT'S, 10c, Grange Road, Chester.

Cherry Wood Pipes.—Unlimited demand. Easily made from any wood. Clear diagrams and instructions plus the secret of the C.W. Perfume, 2/6.—Below.

Lathes.—Well tested, simplified diagrams and clear instructions for any handyman to construct a satisfactory Toy or Model Maker's Lathe from easily obtainable materials costing approximately 40/-. Price 3/6. Parts stocked.—W. BARHAM, "Hilltop," Bradmore Green, Coulsdon, Surrey.

Private Craftsman requires first-class Woodturning Lathe. Really good price for quality machine. Fullest details.—BM/GAA, London, W.C.1.

Lathes (2), Woodworkers' or Toymakers', 3½ centres, 2ft. 9in. beds, treadle operated, easily converted to motor. Condition as new. £9 each. Carriage passenger train about 6/-.—Write, — Andrew, 7, Stoneyfield Road, Old Coulsdon, Surrey.

Wanted.—Second-hand book. "Staining and Polishing." 3/6 net, by Evans Bros., Ltd.—H. A. Knight, 22, Woodside Way, Redhill, Surrey.

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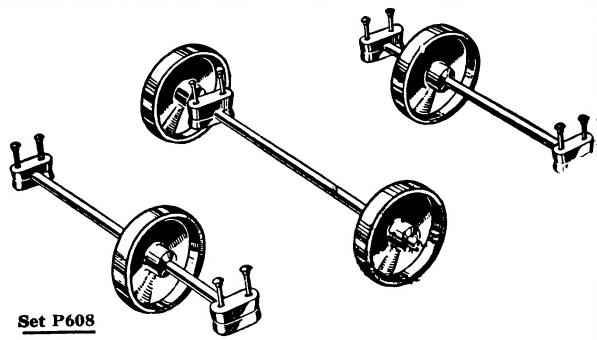

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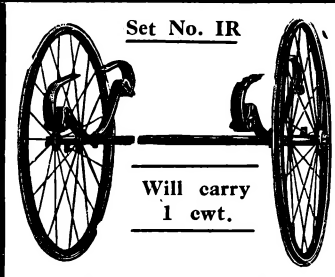

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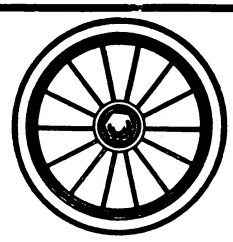

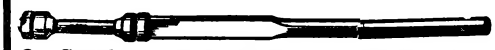

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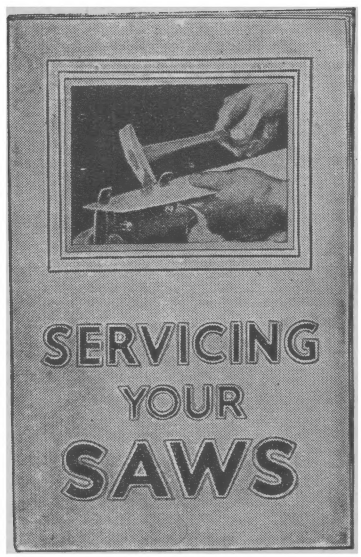

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